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SOUND & VISION

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SUNFIRE
XTEQIO
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P42

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CAMBRIDGE AUDIO CXR120 RECEIVER: All New From Across The Pond

BEAM DREAM

**EPSON'S LS10000
LASER PROJECTOR**

IS A TECHNOLOGICAL
TOUR DE FORCE



**LIGHTS ON,
LIGHTS OFF**

**ELITE PRIME VISION'S
DARKSTAR 9 SCREEN
JUST DOESN'T CARE**

TEN
THE HOMETHEATER NETWORK



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MARTINLOGAN'S MOTION 60XT
DELIVERS A HIGH-VELOCITY
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D.

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Preview

ON THE COVER Beam Dream: Epson's LS10000 Laser Projector Is a Tour de Force. Additional gear from Cambridge Audio, Elite, HiFiMan, MartinLogan, and Origin Acoustics.



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Epson PowerLite
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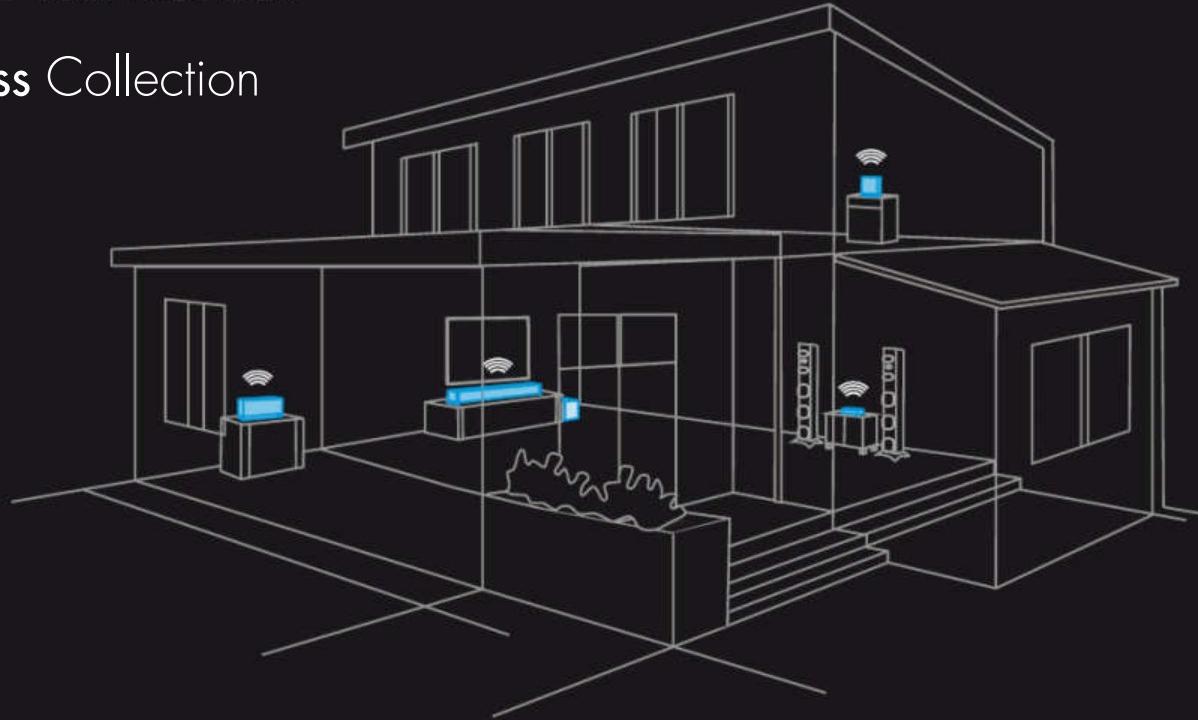


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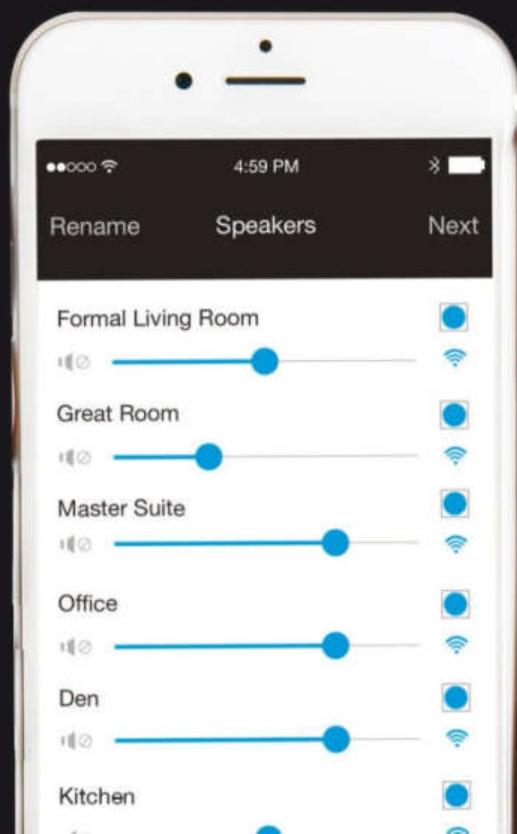


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TEST REPORTS

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GoldenEar's 3D Array Soundbar is "Absolutely Unbelievable"

— Darryl Wilkinson, *Home Theater Magazine*



3D Array \$999

FF3 \$499

"Most exciting soundbar demo I heard"

— Brent Butterworth, *Sound&Vision Magazine*

We call the SuperCinema 3D Array, quite simply, "an extra-ordinary high-end loudspeaker system disguised as a soundbar." It is designed to combine the form factor of a sleek, stylish soundbar, with the performance of a true, high quality, component system. The complete ultra-high-performance system would include a powered subwoofer and a receiver or separates; plus the 3D Array achieves superb three-dimensional surround performance with or without rear surround speakers. Its 2.7" thin cabinet is constructed of aircraft-grade aluminum and contains six of GoldenEar's signature cast spider leg basket bass/midrange drivers and three High-Velocity Folded Ribbon Tweeters along with our breakthrough 3D Technology that cancels interaural crosstalk distortion for total sonic immersion.



High-Velocity Folded
Ribbon Tweeter (HVFR™)



High-Definition Cast-Basket
Bass/Midrange Driver

"Awesome just got redefined"

— Darryl Wilkinson, *Home Theater Magazine*

The 3D Array sounds amazing and the experts certainly agree. Al Griffin of Sound & Vision wrote that the 3D Array System, "...delivered at least 90% of my main rig's [Triton Two Towers] performance." Chris Martens of *The Absolute Sound* raved, "...a soundbar system so good that audiophiles might buy it for music playback alone...if asked to recommend a soundbar to please finicky, hypercritical audiophiles, this would be my hands down choice." And *Home Theater*'s Darryl Wilkinson summed it up perfectly when he raved that, "the width and openness of the soundstage was absolutely incredible" calling it "an instant classic" that is "a must-listen-to, top-of-the shopping list, soundbar-to-beat...when it comes to soundbars awesome just got redefined."

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November 2015

TrackOne

THE CHANGING OF THE GUARD

One by one, the old TV makers are slipping away.



BY ROB SABIN,
EDITOR

Two close-together and closely aligned recent announcements about the flat-panel TV business really got me reflecting on how much that world has changed...and is changing again.

The first was the post on July 31st that, as of January 1, 2016, Japanese manufacturer Sharp, one of the early innovators of LCD technology and a much-storied TV brand worldwide, would be leaving the industry. The announcement said that Sharp had sold its Mexican TV assembly plant and licensed its brand to Hisense, currently the Chinese market leader in flat-panel sets. Sharp TV's next year will, in essence, be Hisense products, though perhaps manufactured in the same place and with some or all of Sharp's pre-existing assets and technologies.

The second announcement was actually a product launch, done with much bombast at a New York City ballroom on August 26th, of a new 65-inch Hisense Ultra HDTV called the ULED 65H10. What made the event noteworthy, to me, was the effort made by executives of Hisense's U.S. subsidiary to thoroughly detail the technology in this \$3,000 TV. It was what we've come to expect in a good premium HDTV: a 240-zone, full-array, local-dimming backlight with highlight-brightening technology akin to HDR sets; 3M quantum dot technology that throws a massively wide color gamut; and a dbx-branded sound system, for example. Hisense executives described a significant R&D effort that began in 2012 to create an affordable yet high-performing platform to stand up to the likes of not only today's best LCD sets, but even the OLED technology now being promoted today solely by LG. A demo stand at the event showed a 65H10 running 4K test clips and competing favorably, albeit in press conference conditions, with a flanking "OLED" (manufacturer unidentified but presumably LG) and an "SUHD" (presumably Samsung).

I won't suggest that competing with the best of Samsung, LG, or Sony is any easy feat; it's one thing to include those technologies and another to use them properly. But what these announcements represent, symbolically, is another changing of the guard. Just as the Japanese and then Korean TV makers came to the U.S. and eventually bought and relegated some great American brands to discount stores, Chinese manufacturers are now following in their footsteps. Don't be surprised: The margins are so thin in the TV business these days and the competition so fierce that sales volume is a critical factor. If you've got it, as do Hisense, TCL (a Chinese competitor that now has its name on what used to be Grauman's Theater in Los Angeles), and AmTRAN (a Taiwanese firm that uses the JVC brand to market sets in North America), you've got the resources to sink some money into R&D, pay for good engineering and parts, and still keep prices low enough to compete. All three of these players have been slowly upping their tech game in the last few years, following a model set by the Korean manufacturers Samsung and LG, which came to the U.S. in the mid-1990s with reputations as budget knock-off brands, but have become world leaders in innovation and truly brilliant marketers here.

In the world of flat-panel TVs, Hitachi, Pioneer, and Toshiba are now gone, while JVC, Sharp, and Netherlands-based Philips have rented out their brands to Asian TV manufacturers. From the old guard, we have the Japanese companies Sony and Panasonic struggling to stay competitive as Korean archrivals Samsung and LG eat their lunch...along with Vizio: an American company that builds its products with Chinese manufacturing and uses its volume and resources to drive the price of technology ever lower, outselling them all in the process. Sure, the names change, but in the end, it all means better tech at lower prices for consumers.

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GoldenEar's Extraordinary New Dual-Plane Inertially-Balanced SuperSub™ XXL^(PAT. PEND.)

"What struck me most was not the sub's powerful and deep low frequency output, which I expected, but rather it's unusually high degree of tautness, transient speed and control" – Chris Martens, *The Absolute Sound*

"Sonic bliss ... remarkably powerful ... they kick ass, totally"
– Mark Henninger, *AVS*

GoldenEar's new flagship SuperSub XXL is an elegantly styled, finely finished and surprisingly compact subwoofer. It can effortlessly generate mega-sub-bass pressure waves of extremely high amplitude, while delivering extraordinarily detailed, accurate and precise low-frequency performance that is both highly impactful and extremely musical. Simply put, it is equally adept at recreating dramatic cinematic sound effects, as well as the subtle musical excellence of Ron Carter, Sting or Yo Yo Ma. To achieve this, we have engineered a unique, patent-pending 360 degree dual-plane inertially-balanced active driver and sub-bass radiator topology, and combined it with a very advanced 56 bit DSP controlled 1600 watt Class D digital electronics package originally developed for our award winning Triton One.

"Bone crushing bass ... sure to be coveted"

– Tom Andry, *audiobolics*

Housed within the gorgeous piano gloss black enclosure are two horizontally-opposed 12" ultra-long-throw active drivers and two vertically-opposed 12-3/4" x 14-1/2" planar infrasonic radiators. This dual-plane, patent-pending dynamic inertial-balancing preserves and focuses all the energy produced by the transducers, in order to more effectively move the air in the room, rather than wasting energy moving the box. It also enables you to hear all the fine subtle details in your recordings. The benefit is a new achievement in state-of-the-art subwoofer performance that, not only "rocks the house", as Big Picture Big Sound's Chris Boylan raved, but is also, "strong, pure and controlled" as Sound&Vision's Mark Fleischman wrote.

You must experience this surprisingly compact and affordable, ultimate-performance super sub!

Best of all, is GoldenEar's signature combination of high-end performance and extraordinary value. Nobody does this better than GoldenEar. In the words of AVS's Mark Henninger, "The SuperSub XXL ups the ante down low". Or as Secrets of Home Theater's Robert Kozel clearly stated, "... this is a bargain for a sub of this performance". Visit your nearest GoldenEar dealer and experience this super sub today.



SuperSub XXL
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GoldenEar's ForceField Subs: "Near perfect...," a tour de force

— Andrew Robinson, *Home Theater Review.com*



FF3 \$499

FF5 \$999

FF4 \$699

"Thunderous...Room-Shaking"

— Al Griffin, *Sound & Vision Magazine*

GoldenEar's ForceField subwoofers are true over-the-top super subs that are especially remarkable for their compact size and unusually affordable prices. All three incorporate the same advanced technology and components including: DSP controlled high-power digital amplifiers (1000, 1200 or 1500 watts), ultra-fast long-throw high-gauss magnet structure drivers (8", 10" or 12") and pressure-coupled downward-firing quadratic planar infrasonic radiators. In addition, their uniquely shaped cabinets are not just attractive, but are also purposefully configured for dramatic performance benefits.

**"Extraordinary bass prowess...
I've never heard a sub this small
go that deep"**

— Steve Guttenberg, *The Audiophilic*

With their high output capability, stunning impact, superbly musical bass articulation and breathtaking infrasonic low frequency capabilities, the ForceFields have received the highest praise from critics, experts and knowledgeable listeners around the world. Geoff Morrison of Residential Systems raved, "their thunder filled the room." AV Forums praised the, "monstrous output for such a small sub." Mark Fleischman of *Home Theater* wrote, "I was dumfounded" over their, "low frequency barrages with floor-shaking confidence." And to top it off, the British writer Stephen May raved, "this astonishing box can pressure-load a room like an angry Silverback" and Andrew Robinson warns, "Your walls, floorboards, and ceiling may just crap out on you." And, as Dennis Burger of *Tech Tell* observed, they are also, "shockingly musical!"

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SOUND & VISION

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GoldenEar has Engineered Our New Triton One to Perform Like a \$20,000+ Super Speaker!

“Revelatory ... cosmically orgasmic ... astounding performance-vs-price ... these speakers absolutely embalm the competition” – Darryl Wilkinson, *Sound & Vision*



“Triton One shames some speakers costing ten times as much ... it is an absolute marvel”

– Caleb Denison, *Digital Trends*

“Best High-End Value at CES 2014 ... Sandy has created a speaker that defies its price point”

– John Sciacca, *Residential Systems*

“Best of CES 2014 ... stunning realism ... the sound was truly grand and majestic” – Roger Kanno, *SoundStage*

“Best Sound for the Money at CES 2014”

– Jonathan Valin, Kirk Midskog and Neil Gader, *The Absolute Sound*

Introducing Triton One, an evolutionary speaker that builds upon advanced technologies that have made Tritons mega-hits around the world. Stereophile called them, “*A Giant Killer Speaker*” and Robert Deutsch further added, “*it’s not unreasonable to compare the sound of the \$4998 Triton One with speakers costing tens of thousands of dollars more*”. This new top-of-the-line flagship was engineered to deliver even better dynamics and bass than the extraordinary Triton Two, along with further refinement of all aspects of sonic performance. How well have we succeeded? In the words of HD Living’s Dennis Burger, the Triton One delivers, “*... the sort of upper-echelon performance that normally only comes from speakers whose price tags rival a good luxury automobile*”.

Triton One “creates visceral, tangible waves of pure audio bliss”

– Dennis Burger, *HD Living*

Great sound is what it is all about and the Triton Ones deliver, as The Absolute Sound’s Anthony Cordesman wrote “*they provide sustained musical pleasure and exceptional realism ... extraordinary sound quality and value ... one of the best buys in speakers ... highly recommended*”. The Ones were specifically engineered to excel with all types of music as well as movies. Best of all, they offer previously unheard of value, as Brent Butterworth wrote in Sound & Vision, “*I heard a few people saying the Triton One sounded like some \$20,000-and-up high-end towers, but I disagree: I think they sounded better than most of them*”. Hi Fi+’s Chris Martens raved the Ones are, “*jaw-droppingly good ... one of the greatest high-end bargains of all time with a dazzling array of sonic characteristics*”. And Darryl Wilkinson summed them up best, “*A Masterpiece ... GoldenEar has fully ushered in the Golden Age of the Loudspeaker*”. Hear them for yourself and discover what all the excitement is about.

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Introducing the New
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“With Triton Ones, GoldenEar Technology has fully ushered in the Golden Age of the Loudspeaker”

– Darryl Wilkinson, Sound & Vision

“In every criterion that matters to me, the speaker simply punches way above its weight class ... there’s an awful lot of magic to enjoy here”

– Dennis Burger, HomeTheaterReview.com

“It provides extraordinary sound quality and value for the money. They have all—or more—of the features and technology that anyone looking for specsmanship could want, but their real merit is that they provide sustained musical pleasure with exceptional realism. Highly recommended”

– Anthony Cordesman, The Absolute Sound

“It is an absolute marvel ... Triton One shames some speakers costing ten times as much.”

– Caleb Denison, Digital Trends

“Even with your eyes open, it’s practically impossible to make yourself realize that you’re not listening to living, breathing human beings playing actual instruments in front of you.”

– Darryl Wilkinson, Sound & Vision

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Letters

We welcome
questions and
comments

E-mail them to HTLetters@sorc.com. Please note: Questions about the features and functions of a particular product are best directed to the manufacturer. Questions about what product you should buy are best directed to a dealer who knows all the details of your system, your preferences, and your personal habits. All submissions are considered the exclusive property of Sound & Vision magazine and TEN: The Enthusiast Network. We reserve the right to edit letters for brevity. Due to the volume of mail that we receive, we regret that we cannot respond to every letter.

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Those Pesky Pics

I have read most of the letters you print for many years, but I've yet to see anyone mention one of my biggest pet peeves, movie-wise. We have a mid-level projector in our theater that automatically zooms based on whether the video is 16:9 or 2.35:1, which is nice and useful for having a constant-height picture to fill the screen. However, upon the change in zoom, it does not automatically recenter the image; I have to adjust that by hand using the wheels on top of the projector after zooming. Which brings me to the issue. Why can't they standardize *all* of the content on each disc to be one ratio or the other? It almost never changes during the movie itself, but during the previews and special features, it happens constantly. Especially during the making-of bonus features, where they show something behind the scenes, almost always in 16:9, interspersed with scenes from the film, which are quite often 2.35:1. That nonsense makes our projector constantly zoom in and out—talk about annoying! Not to mention that when the zoom changes, the image is no longer completely on the screen unless I manually readjust it. I wish you would make it known to the companies that make DVDs and Blu-rays to standardize *everything* on each disc to one ratio or the other, including the menus. It would not be that hard for them to do.

Greg Francis

Via e-mail

Well, actually, yeah, it would be hard for them to do. The affliction you suffer from is the same one we all have to live with: the discrepancies that arose years ago between a legacy television broadcast system that was standardized in the 1930s on the old Academy 4:3 film aspect ratio, and the movement of modern cinema auditoriums to 2.35:1 or variants of that widescreen formatting. TV/home video never caught up, and when we had the chance, the new HDTV standard grew our TVs to 16:9 and not 2.35:1 (or one of its close variants). So you get low-budget making-of videos shot in digital at 16:9, and full feature content shot in either film or digital video in 2.35:1 to match the theaters. Getting it all to match would mean something has to undergo a pan-and-scan to fit, which means production cost for the studios and a sacrifice of at least some portion of the image for one or the other.

But your real problem is your projector or control system, which shouldn't be jerking your picture around like a yo-yo when you don't want it to. Why not just turn that feature off when you go into your bonus features? If you have a universal remote control system, you might be able to create an easily accessible button for this.—RS

My Head Is Exploding

I have owned a pair of Sennheiser HD 600 headphones for years and have enjoyed their performance. I recently purchased a pair of HiFiMan HE-400 headphones. My primary source for an amplifier is a Yamaha RX-V465 A/V receiver. When I plugged in the HE-400s, I noticed that the output level of the HiFiMan



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without hearing
all about it.



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LETTERS

'phones was very low compared with the Sennheiser's. The specifications for the HiFiMan is 93 decibels SPL and an optimal impedance of 32 ohms. The specifications for the Sennheiser is 97 dB SPL and an optimal impedance of 300 ohms. From first appearance, the SPL level for the HE-400 is 4 dB less than the HD 600. This could explain some of the lower output level. But I had to increase the amplifier output level by at least 15 dB to get a similar output compared with the HD 600. Since I normally listen to music CDs at an amplifier level setting of -22 dB with my Sennheisers, I had to increase the amplifier level setting to about -5 dB to get any reasonable output from the HiFiMan HE-400. I have read that lower-impedance headphones are easier to drive than higher-impedance headphones. What is going on here? Is this a result of the magnetic planar design of the HiFiMan HE-400 compared to the typical transducer driver design of the Sennheiser HD 600? Or is there something wrong with the pair of HE-400s that I purchased?

Larry Gates

Via e-mail

Audio technical editor Mark Peterson responds: "As with loudspeakers and bigger amplifiers, the devil is likely in the details, which aren't included in the published specifications. Beyond that, it gets really complicated fast, and I can't find enough technical details about these products to diagnose this specific phenomenon. I can give some general thoughts on the subject, though, which might help.

"For the same reasons we publish loudspeaker sensitivity with the drive level in volts instead of watts, headphone sensitivity should also be stated in volts instead of watts. The reason for this is to take the impedance (at least theoretically) out of the comparison by using a standardized, fixed voltage. Details of the conditions of test are crucial to compare rated numbers fairly, and neither of these manufacturers provides much information on how their sensitivity number was derived.

"Just like with loudspeakers, lower-impedance models require more drive current and less voltage per watt than higher-impedance loads, which require more voltage and less current. Remember that watts = volts x amperes, so even if the watts are the same, the voltage and current required may be quite different depending on the impedance of the load. Amplifiers are rarely perfect sources, however, so real-world experience may vary.

"Since available 'rail voltage' from the battery in a portable player or smartphone is extremely low, there is rarely much more than 1 volt of audio signal output to drive headphones from these devices, so lower-impedance models will usually play louder.

"For AC line-powered sources, the rail voltage is rarely a problem, so higher-impedance headphones may be appropriate. What often comes into play is a high output impedance (greater than 1 ohm or so) and its ratio to the headphone impedance. If this ratio becomes too close, lower-impedance headphones will be at a disadvantage, and higher-impedance models might play louder.

"Always try your exact combination of

headphones and likely sources before you commit, if possible. The HiFiMan planar model claims less sensitivity; they may not be totally forthcoming about just how much."

Yeah, Whatever...

I'm used to the aversion to science in the audio press, probably for fear it will discredit and drive away advertisers, but the blatant misuse of clearly defined scientific terminology is unacceptable. "Evil Frank Shot in 6K" in the September 2015 Perfect Focus column referred to 6K as having nine times the resolution of 2K. Not true! Resolution is measured in lines per unit of distance, so 4K has twice the resolution of 2K and 6K three times the resolution of 2K. With symmetrical increases in resolution in both horizontal and vertical directions, that would square the number of pixels required, but pixel count is *not* equivalent to resolution. Pixel counts give bigger but less understood numbers to sound more impressive than resolution if hype is your intent, but the difference is purely semantic. If you want to praise speakers with response curves less flat than the Himalayas, you are entitled to your opinion, but the definition of resolution is not. It's a matter of literacy, which is not an unreasonable expectation from a professional journalist.

Dennis L. Green

Via e-mail

An image captured by a 6K camera does indeed have more than nine times the pixel count than HD, but I'll acknowledge that if you move into the science of visual perception, the technical definition of "resolution" perhaps changes. We in the video world equate pixel counts with resolution when in fact they merely signify a numerical reference of the potential for an improvement in visual perception of detail. So yes, we and everyone else who reports on video technology are loose with the language in this fashion (though I can't say your numbers for the increase in resolution actually make much sense to me). No matter—we will continue to follow industry conventions our readers will understand rather than trying to reinvent the world because of what some uptight physicist might say.

As for the derogatory remark about the audio press ignoring science "for fear it will discredit and drive away advertisers," that's just dark skepticism that completely ignores the efforts "professional journalists" like us take to ensure the technical accuracy of our reviews and writings, which includes, in our case, a full vetting of most audio reviews by a bona fide and highly qualified audio engineer. I'm going to assume you didn't mean us.—RS

CORRECTION

In our September reviews of the Dayton Audio B652-AIR and DALI Zensor 5 speaker systems, images of the Dayton SUB-1000 and HSU VTF-1 MK2 subwoofers were inadvertently swapped with other Dayton and HSU products. The correct images can be seen with the online reviews at soundandvision.com. We apologize for any confusion.



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- Jeff Fritz, *SoundStage! Network*, October 2013 (e112)

“...a no-brainer highest recommendation if ever I heard one.”

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- Daniel Kumin, *Sound & Vision*, February 2014 (e110)

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1200 watts



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Perfect focus

NEW GEAR, TOP NEWS, HOW TO, AND MORE...

Edited by Claire Crowley

Sonic Flashlight

● HyperSound Clear Audio Beaming Technology

Imagine if you could focus sound the same way you beam light from a flashlight. Think of the possibilities. You could direct sound to Bill, and Betty, who's sitting right next to him, wouldn't hear a thing. Sort of like headphones without...uh...the 'phones.

Sound far-fetched? Not at all. Inventor Woody Norris demonstrated the technology behind such audio beaming more than a decade ago under the Hypersonic Sound banner. (Type his name into the search bar at ted.com to see Woody in action.) I remember when he stopped by our offices with an early prototype back in the early days of *Sound & Vision*. Actually, it may have been during the latter days of *Stereo Review*, predecessor to this magazine. His setup was kinda kludgy, but it worked, projecting a narrow beam of sound from one side of my office to the other. I often wondered what

became of Woody and his remarkable invention. Would he find a consumer or commercial outlet for it?

My question was answered in a summer press release from Turtle Beach announcing a "first-of-its-kind" system to aid the estimated 48 million Americans who suffer from hearing loss and, as a result, have difficulty hearing their TV (or the sound system connected to it). Turns out the technology behind what Turtle Beach is calling HyperSound Clear is a direct descendant of the Hypersonic Sound system Norris invented way back when. I couldn't have imagined a more perfect application.

Turtle Beach, best known for its high-end PC and gaming peripherals, plans to bring the audio beaming system to market late this year through a partnership with Audiology Management Group (AMG), which provides products and services to the healthcare industry.

Expected to sell for about \$1,500, the HyperSound Clear system comprises a small, remote-controllable digital signal processor/control box and two compact panel speakers, but, instead of spraying sound around the room, these speakers effectively emit a highly controlled, narrow beam of sound that travels directly to the listener's ears. (Actually, it's

way more complicated than that: Ultrasound is used as a carrier to create sound at the listener's ears instead of at the face of the speaker. Visit hypersoundhearing.com for more information.)

Turtle Beach says the result is a "highly immersive listening experience, similar to wearing headphones, in which listeners get clear sound where they want it, without affecting others in the room."

Hearing professionals can even tailor the sound to specific hearing profiles and preferences." The

company also points to the results of recent clinical research in which 10 patients with mild to severe hearing loss experienced an improvement in sound clarity, especially speech discrimination, when using HyperSound technology.

"Approximately 80 percent of people who go see a hearing healthcare specialist for the first time do so because they're having trouble hearing and understanding the television, and we think HyperSound Clear will be a great entry-level hearing healthcare device that directly addresses that issue with hearing and enjoying home entertainment," said Rodney Schutt, a senior VP at Turtle Beach.

Turtle Beach just might be onto something for the god-knows-how-many boomers who know they have a problem but hate the



● HyperSound Clear focuses sound in a narrow beam.

idea of wearing a hearing aid. Statistics show a gap of 5 to 7 years between when a patient first visits the audiologist and when he actually gets a hearing aid. HyperSound to the rescue.

More information is available at hypersoundhearing.com.
—Bob Ankosko



This Just In...

By Mark Fleischmann

Amazon's 4K Ultra HD Streaming

is the first to support HDR (high dynamic range) video technology. Accessible to Prime members, it kicked off with the original series *Mozart in the Jungle* on Samsung UHD TVs via the Amazon video app...



Streaming and Vinyl

were up 92.4 percent and 38.4 percent, respectively, say Nielsen numbers for the first half of this year. Vinyl's 5.6 million units are now 10 percent as big as the CD market, which continues to tumble...

TiVo Can Stream to Apple TV

via AirPlay thanks to an update of its iOS app. This applies to certain Roamio and Premiere models sold at retail plus those leased from pay-TV providers...

Comcast's Stream

is a \$15/month service that brings a dozen channels to tablets, phones, and laptops. It's an add-on to existing broadband contracts, rolling out first in Boston, then maybe Chicago and Seattle...

Sony's PlayStation Vue

will offer streaming of Showtime, Fox Soccer Plus, and local/regional sports

channels. The à la carte video platform piggybacks on PlayStation 3 and 4, starting in Los Angeles, San Francisco, New York, Philadelphia, and Chicago...

Wi-Fi Will Reach 90 Percent

of broadband homes by 2019, up from 66 percent in 2014, according to IHS—but that will cause significant congestion with things like cordless phones and microwave ovens competing for bandwidth. This is “forcing ISPs to take ownership of the home network,” says an analyst...

The First Live 8K

video demos in North America were FIFA Women's World Cup matches, courtesy of Fox Sports and Japan's NHK.



They were broadcast in 22.2-channel surround sound...

Netflix-Recommended TV

certification now adds Panasonic to a list that already includes LG and TCL. Sharp, Sony, and Vizio are expected to join momentarily...

Ads on Netflix?

Seventy-nine percent of subscribers would pay extra to avoid it, says an Exstreamist poll. Another 56 percent would cancel if forced to watch ads...

Netflixers Still Like Pay-TV

said a TDG survey covering 2012 to 2015. Netflix customers subscribing to pay-TV services declined a little, from 87 to 84 percent, but pay-TV customers subscribing to Netflix rose from 36 percent to 49 percent...

NBC News' Amazon Fire TV App

includes live news feeds, segments from the *Nightly News* and other shows, and original series. One of the latter is *Meet the Candidates*, which interviews presidential hopefuls...

Showtime Killed the SHO Sync

app for mobile devices and TVs, ending its three-year run. It may re-emerge in different form...

YouTube Is Bigger

than any single U.S. cable network, executives told investors, with visitors to the homepage tripling over the past year, and actual watch time up 60 percent. Mobile use is a big contributor, with average sessions topping 40 minutes...

Chromecast Is Getting Ethernet

through a \$15 accessory that plugs into the Google device's USB port. Just in case the Wi-Fi traffic in your household has gotten too congested...

Streaming Is 28 Percent

of all TV viewing, says GfK MRI. That breaks down to 16 percent on computers or mobile devices, 9 percent on connected TVs, and 3 percent on game consoles and other devices...

The Ideal à la Carte

video package consists of 17 channels, well under the number cable subscribers are forced to buy, says Digitalsmiths, the TiVo-owned search specialist. Its survey of 3,140 consumers

found 81.6 percent are interested in the concept...

Sprint Killed Its 600 kbps Limit

on video streaming for two plans sold through Best Buy following consumer outcry. However, it hedged by saying “we might have to manage the network” at peak times...

Pay-TV Will Be in 50 Percent

of the world's homes by 2017, according to ABI Research. The Asia-Pacific market is growing fastest—but with Netflix launching in Australia, New Zealand, and Japan, cord cutting may erode revenues in those places...

Millennials Love Smart Home

products, says an NPD study, with 41 percent interested. This is extending popularity of home automation beyond homeowners, since many millennials rent...

Sony Launched High-Resolution

Music Stations at 70 Best Buy Magnolia Design Centers. Featured products include Walkman music players, headphone amps, and music servers...

Handson

Hifiman HE1000 Headphone

By Steve Guttenberg

Lo and Behold!

PRICE \$2,999

WHAT? \$2,999 FOR HEADPHONES? Can they be worth it? Yes, and yes. It's not just that the Hifiman HE1000 sounds more transparent, spacious, and dynamic than other headphones: With the HE1000, music arrives more intact—there's more there there.

The Hifiman HE1000's open quality makes you realize not all open-back headphones sound equally open. You don't have to be an engineer to understand why: Just look at the HE1000 ear cups' thin horizontal blades that minimize reflections to a remarkable degree and expose most of the back surface of the diaphragm to the air. That's in stark contrast to other open-backs' perforated grilles that reflect some of the drivers' sound back onto the drivers. The

AT A GLANCE



Plus

- Luxurious design
- Extraordinarily spacious sound
- Advanced nano-thin planar magnetic drivers



Minus

- A big, definitely not-so-portable headphone
- Crazy expensive

HE1000's ultra-thin (less than 0.001 mm thick) drivers encounter no such interference, so they're free to unleash a huge soundstage.

The ear cups are unusually large at 5.2 inches high and 3.9 inches wide.

The size is a byproduct of the HE1000's ear-shaped planar magnetic drivers that project sound over a larger area of your outer ears than the round or rectangular diaphragms on other full-size headphones. Ear-clamping pressure is commendably light, and the leather headband distributes the HE1000's weight of just over 1 pound over a large area of your head. So the HE1000 isn't the least bit fatiguing to wear for extended periods of time.

A lot of hand labor goes into building an HE1000 from beautifully finished steel, aluminum, real cherry wood, and leather. When you hold this headphone in your hands, you feel the quality of the design. The warranty runs three years, considerably longer protection than what you get with most high-end headphones.

The HE1000 comes packed in a handsome tan leather-wrapped storage box; packed inside, you'll also find three sets of copper/silver cables, two 9.5-foot-long cables, one fitted with a 1/4-inch plug, the other cable with a four-pin XLR plug for use with balanced headphone amps.

The third cable is 57 inches long, and it's terminated with a 1/8-inch mini plug for use with portable music players or desktop use.

Directly comparing the sound of the HE1000 with an Audeze LCD-X open-back planar magnetic headphone was a fascinating exercise. The LCD-X is an awfully good headphone, but it sounded smaller, dimensionally flatter, and more opaque with a 192-KHz/24 bit hi-res FLAC file of David Chesky's new orchestral work, *Joy and Sorrow*. The HE1000 presents a clearer window to the sound. Bass slam, dynamics, definition, and texture are stunning; you hear deep into the bottom end of your recordings with rare precision. The HE1000's highs are supremely sweet, airy, and hyperextended, which seems to play a role in liberating the soundstage from the ear cups.

Listen to John Coltrane's *Ballads* album, and start with the last cut, "Nancy (With the Laughing Face),"

RATING

Hifiman HE1000 Headphone

Performance

Build Quality

Comfort

Value



THE VERDICT

The HiFiman HE1000 is pricey, but it sounds so clear and open other headphones sound dull and drab by comparison.



and you can *feel* the presence of Coltrane's sax. That little bit of extra reverb just before he moves in closer to the mic raised the hairs on the back of my neck, because I felt his sax getting closer to me!

I used a bunch of headphone amplifiers over the course of this review—Oppo HA-1, Hifiman EF-6, and Vinnie Rossi LIO—and heard great sounds with all of them at home. Listening to vinyl through the LIO with the balanced cable topped the list; with its spacious sound and delicious tonality, the HE1000 melted away, and I was one with the music.

On the go, I used Astell & Kern's new AK Jr music player, but Hifiman's uber player, the HM-901s+, is the best-sounding portable music player I've heard to date.

If the \$2,999 HE1000 is a bit out of reach, no worries. Just as I was finishing this review, Hifiman announced their next planar magnetic headphone, the HE400S, which will retail for \$299.

SPECS

Type: Over-the-ear • **Driver:**

Planar Magnetic • **Impedance:** 35 ohms • **Sensitivity:** 90 dB/1mW •

Weight (Ounces): 16.9



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The Connected Life

JOHN SCIACCA

Big Sound—Planning for Your Audio Install



Last month's column dealt with some of the big-picture infrastructure items when planning a video installation. Beyond the brand and size of TV you'll be getting, the big four pre-installation items requiring attention are power, sources, audio, and control.

This month, I'm tackling things to consider when adding an audio system. Many people think audio is a simple install now because there are so many wireless options available, but wireless refers to transmitting and receiving the audio signal, and systems still require wiring from the amplifier to the speakers. And while wireless systems like Sonos and PlayFi are great problem solvers, they might not be the ideal solution for everyone.

When it comes to filling your home with great sound—or any sound, for that matter—you want to focus on these four things: location, control, zones, and TV audio.

Location

Depending on how many rooms you're adding music to, the install will likely require a decent stack of gear and a fair amount of speaker wire.

Many people think audio is a simple install because of wireless options.

Because of this, the equipment location needs to take into account ventilation, wire management, and future accessibility/serviceability. With a wireless or network-based audio system, you could decentralize the gear, say, locating amplifiers in various rooms around the house or a top shelf in a closet. This method shortens speaker runs and eliminates the need for a rack of equipment. The more traditional method is to "homerun" all of the wiring to a central location. This centralized approach is nice because it makes upgrading easier down the road since everything is all in one spot.

Control

Likely the only audio equipment in any given room will be the speakers, so how users interact with the system is crucial. While most modern systems offer terrific smartphone and tablet control, the main drawback with these app-based control systems is that guests are unable to use



them. Even if you installed the app for them—and allowed them to log onto your network and connect to your system—they probably couldn't figure it out. If this isn't a concern, then by all means go with an app-based control system. My company often installs good old, tried-and-true volume controls in guest rooms for easy level adjustment of the music the homeowner selects. In-wall keypads or touchscreen-based systems are another option. The advantage is these devices are always on, never leave the room, and can provide simple, one-touch access to music.

Zones

In housewide audio parlance, a zone is an area that can play something different from another, and a zone could consist of one room or 100. The more zones you have, the more flexible (and likely expensive) the system will be. Many audio distribution systems come in a six-source/six-zone chassis, with inputs and amplification to drive six rooms. However, if you don't need the flexibility of six different things playing at once, a simple one-, two-, or three-zone system might be perfect. In fact, just using the Zone 2 output on many A/V receivers is often enough to satisfy the music needs of smaller households. By connecting your source to a powerful amplifier and speaker selector/protector, or by using a multichannel amplifier, you can add volume controls in each room to provide a simple and low-cost way to tailor the volume in each sub-zone listening space.

TV Audio

Many people assume the TV's audio will come out of the housewide speakers, and it can, but it takes some planning and hardware to work. Televisions can't drive an external pair of speakers, so there are a couple of solutions. Option one is running the TV's audio signal back to the house audio amplifier and just making it another source. Option two requires a device like Sonance's SonAmp ASAP3D SE. This is an automated A/B speaker switcher with an internal amplifier. When the TV is off, the speakers play the housewide music; when the TV turns on, they automatically start playing the TV sound. Simple, cool, and a terrific solution.

Sears Bows Connected Solutions

Sears' Connected Solutions in San Bruno, California, is a 4,000-square-foot showroom within a store with room vignettes that mimic a kitchen, living room, nursery, bathroom, backyard, laundry room, and garage. It includes a Simply Entertaining section for smart TVs, mobile devices, and Bluetooth speakers; a Simply Fit section for fitness trackers, wireless bathroom scales, and gym gear; a Simply Automated section for app-controlled lighting and smart appliances; and a Simply Secure section for doorbells, security cameras, and smoke alarms. Smaller versions with half the products will roll out over the next few months.—MF



TWC Fined for Robocalling

A federal judge fined Time Warner Cable \$229,500 for robocalling a Texas woman 153 times in an attempt to dun another customer. Not only did the calls continue after the woman had called TWC to discuss the error—74 of them came in after she had filed suit. That last part especially annoyed the judge, who levied a fine of \$1,500 for each call. The cable operator is now "reviewing the ruling and our options."—MF





MONITOR AUDIO

Silver 2

"...the tweeter reveals real delicacy that makes rivals seem rather ragged in comparison."

- Hi-Fi Choice
Dec. 2014

Silver 6

PRODUCT OF THE YEAR

- SoundStage, 2014

"You need to hear them.
Pronto."

- What Hi-Fi?
Dec. 2013

Silver 8

"I've been looking at speakers for \$3,000/pair or less for a while, and have not heard any that I would prefer to the Monitor Audio Silver 8."

- Kalman Rubinson
Stereophile, Jan. 2015

Silver 10

"...one of the best \$2,500-and-under full-range floorstanders I've heard."

- Spencer Holbert,
The Absolute Sound
Dec. 2014



Fast forward to 5th generation Silver; the initial design goals set out by Dean Hartley and his colleagues in the UK remained unchanged...

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Silver series

Upgrade Issues



I am switching over from a 5.1 speaker system to a soundbar but would still like to use my current Paradigm PW 2500 subwoofer with it. Are there any new soundbars that can be used with an existing powered sub?

John Rothery / Tacoma, WA

Yes. Although most low-cost soundbars come paired with their own, usually wireless, subwoofer, when you step up to the mid- or high-end price range, you'll find numerous options that can mate with your existing Paradigm sub.

Virtually all powered soundbars (those with built-in amplification) feature a subwoofer preamp output that you can connect to your Paradigm subwoofer. A good example of this type would be Paradigm's own SoundScape three-channel soundbar (\$1,150). Along with providing a subwoofer preamp output, the SoundScape has a built-in transmitter that can wirelessly send a low-passed (80-hertz) signal to its included wireless receiver. Just connect the wireless receiver's output to your Paradigm sub's RCA-jack LFE input, and you'll be good to go.

Passive soundbars, on the other hand, provide no built-in amplification and need to be connected to the speaker outputs on a receiver or amplifier. Good examples of passive soundbars are Golden-Ear Tech's three-channel SuperCinema 3D Array X (\$1,000) and 3D Array XL (\$1,600). If you choose to go the passive route, incorporating your Paradigm sub into the system will be super-easy: Just set things up as you did previously with your 5.1 speaker system, with the speaker size adjustment set to Small (or 80 Hz if your electronics

Are there any soundbars that can be used with an existing powered subwoofer?

provide advanced speaker crossover controls) and a cable running from the receiver's subwoofer output to the Paradigm's RCA-jack LFE input.

I own Paradigm Monitor 11 speakers and an 80-watt powered subwoofer. The speakers are set up in my living room 6 feet out from a sliding glass door. What type of acoustic treatment product should I put up behind the speakers to improve their sound? Should it be foam or something more solid?

Jon Cotton / via e-mail

Reflected sound bouncing off the walls, floor, and ceiling of your room can negatively affect sound quality. What you need to be most concerned with is early reflections, or the sound that bounces off surfaces closest to the speaker—typically the side walls in most stereo and home theater setups.

While reflected sound off a front wall can create problems, in this case your speakers are positioned 6 feet out into the listening room—far enough that early reflections off surfaces behind them shouldn't be an issue.

Another factor here is that you are using a subwoofer to handle bass duties. The low bass frequencies conveyed by subs radiate equally in all directions. Mid and high frequencies, on the other hand, are more directional, primarily radiating forward from your speakers. This is the most important range you can hope to treat for.

The upshot here is that, given your current speaker layout, applying acoustic treatments to the front wall of the room isn't exactly crucial (though you may want to consider putting something absorptive like curtains over the glass doors to absorb any sound that ping-pongs off the back wall of your room). Your best investment will be to install acoustic panels or other treatments on the side walls of your room where early reflections from your speakers are most likely to be an issue.

I have a Samsung UN55HU7250F UHDTV that's currently being fed by a DVD player. Here's my question: Since the TV upscales signals to 4K, will there be a significant advantage in upgrading to a Blu-ray player if the discs I watch are all DVDs?

Patrick Tyler / Boulder, CO

Absolutely. The visual benefits of Blu-ray over DVD are substantial. Even when a DVD is scaled to 4K by a UHDTV, the image won't look nearly as good as it would with a Blu-ray source. That's because DVD resolution is 345,600 pixels, while Blu-ray provides over 2 million pixels. And when it comes to scaling, where you create new pixels from existing ones, the more picture detail you start out with, the better. Also, most Blu-ray players at this point in the game are absurdly inexpensive.

Another option here would be to wait until new Blu-ray 4K players arrive—it's anticipated that they will be available by the end of 2015. However, since your UHDTV is a 55-inch model (a relatively small screen size for a 4K set) that isn't compatible with forthcoming Blu-ray 4K features such as High Dynamic Range, you'll get the best image quality bang for your buck by simply ditching DVD for Blu-ray.

This Is Your Brain on Music

Music services like Pandora generate musical recommendations based on your listening habits. Will the next step be to recommend music based on your brain type? In a study called "Musical Preferences Are Linked to Cognitive Styles," researchers at the University of Cambridge asked 4,000 participants to fill out questionnaires and rate several pieces of music. Their goal was to classify listeners according to the E-S (empathizing-systemizing) theory. Type E (for empathetic) individuals preferred "music that featured low arousal (gentle, warm, and sensual attributes), negative valence (depressing and sad), and emotional depth (poetic, relaxing, and thoughtful)."

That might translate into R&B, country, or folk, among other things.

Type S (systemizing, analytical) people preferred "music that featured high arousal (strong, tense, and thrilling) and aspects of positive valence (animated) and cerebral depth (complexity)." They were more into punk, heavy metal, and hard rock. The study is available at <http://journals.plos.org/pone/article?id=10.1371/journal.pone.0131151>.—MF



Cable Box Cost

The average pay-TV subscriber pays \$89.16 per year, or \$7.43 per month, to rent a single set-top box. Households with multiple boxes pay more, raising the average to \$231.92 per year. Consumers no longer have the option to buy their own boxes. In 2014, Congress repealed the security integration ban, and it will sunset at the end of this year. After that, pay-TV providers will no longer have to provide security compatibility with store-bought boxes.—MF



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[Your Name Here] Audio Corporation



When we think of audio companies, images of tall buildings, rows of cubicles, and loading docks usually come to mind. And it's true that many audio companies are still like that. But a more contemporary image of an audio company would be you in your pajamas. You see, technology manufacturing isn't what it used to be.

I've been aware of the new paradigm for quite a while, but an article in Bloomberg Business News really brought things into focus. Titled "Start Your Own Smartphone Company for \$1,000," and authored by Tim Culpan, it describes how that small sum can let you compete against Apple and Samsung. In particular, you can have a smartphone custom-made for \$20, with a minimum order of 50 units. Then you have a shot at becoming the next Steve Jobs.

As founder and CEO of [Your Name Here] Corporation, you would contact any number of Chinese companies that can source the components that con-

You have a shot at becoming the next Steve Jobs.

stitute a smartphone, then assemble the parts, and ship the product to you. Just tell them what toppings you want on your pizza, um, phone, and they do the rest. The plastic case, screen, camera, boards, battery, and Android operating system (free!) all joined into a working phone bearing your company's name, can be in your hands in six weeks.

Your company can dispense with niceties like research scientists, software, and hardware engineers, quality-control people, retail stores, and much of the other traditional corporate layers. Can such a business model actually succeed? You bet it can. From humble origins, companies like Xiaomi and



OnePlus are major players in the global smartphone market.

Smartphones are bona fide audio products, but what about other audio devices? Surely that market follows more traditional business models. Well, of course, many of the familiar names in audio are still around, offering splendid products. But some of the most exciting products are coming from unknown startups that use the new outsourcing model.

I am regularly contacted by Chinese companies eager to design and build audio products to my specification. For example, I just received an invitation to the Loudspeaker Sourcing Show, held in Nansha, PRC. As their materials advise, and as its name implies, "The Loudspeaker Sourcing Show is a one-stop shop to source all loudspeaker components, drivers, or complete system needs. The show will be peppered with driver and complete turnkey factories both large and small. There will also be amplifier and headphone manufacturers. This is the sourcing show to attend."

I can pick out my cones, surrounds, spiders, cabinets, and all the other loudspeaker hardware. Also on hand will be packaging and shipping companies and Chinese/English translators ready to work for me and even a Chinese law firm that can answer any legal questions. Last but not least, the show will conclude with a poolside party and a '70s and '80s cover band.

That's just crazy, you say. A person would have to be nuts to start an audio company. Well, people probably said the same thing to Peter Bang and Svend Olufsen, Amar Bose, John Bowers and Ray Wilkins, Ray Dolby, Leo Fender, Sidney Harman, Jimmy Iovine and Dr. Dre, Henry Kloss, James Lansing, Akio Morita, Frederick and Gerard Philips, Fritz Sennheiser, and Sidney Shure. In fact, with Chinese outsourcing, never in history has it been easier to start an audio company. Indeed, your biggest obstacle is the fact that it's so easy to start a company, and that is inspiring many entrepreneurs to give it a try.

Ken's Audio Corporation, Inc. Hmm, that has a nice ring to it.

Soundbars Are for Music Too

Once a soundbar is mounted on the wall below the TV, a lot of folks are tempted to use it for music. An NPD Group survey found that 55 percent of soundbar owners use it for such things as podcasts and radio (though probably not vinyl). That makes sense, since more than 80 percent of bars have Bluetooth capability to communicate with mobile devices. Among 18-to-34-year-olds, 66 percent use the bar for music. As soundbars wax, other product categories wane. Forty-five percent of soundbar owners retired a home theater in a box system and 35 percent retired an A/V receiver.—MF



AT&T and DirecTV to Merge

The Federal Communications Commission has approved the merger of AT&T and DirecTV, bringing together the former's hybrid fiber-copper TV delivery system and the latter's satellite service under the same corporate umbrella. The \$48.5 billion deal comes with strings attached. The combined company will have to bring fiberoptic Internet service to 12.5 million households, with discounts to low-income households, plus gigabit service to schools and libraries. It will be forbidden to discriminate against online video services (Netflix, et al.). And that's important, since AT&T is the only major ISP to impose data caps. The combined company will have 26 million subscribers in the U.S. and 19 million more in Latin America.—MF

Stop That or I'll Make You Watch TV

Second-screen use is "creating a generation of kids for whom TV is punishment," says Miner & Co. Studio. The marketing firm surveyed 800 parents of children ages 2 to 12. Fifty-seven percent of parents said their kids like watching video on "a device other than the TV." Kids prefer tablets because they are portable, have touchscreens, are easier to use, allow more independence, and allow re-watching of content. So when a kid acts up, the parent yanks the tablet and makes the kid watch the family TV. Another 41 percent of parents said their kids prefer using tablets to having desserts.—MF



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More than 40 years ago, Bryston began engineering amplifiers that would become world renowned for precision, accuracy and musicality. Like our amplifiers, Bryston digital audio components are frequently ranked as the finest available. Both the Model T and Model A series of loudspeakers are winning awards and setting new expectations for performance while music lovers immerse themselves in a personal paradise with the award-winning BHA-1 headphone amplifier.

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Apple Music Is Worth It



I was skeptical that Apple's all-you-can-queue subscription plan, Apple Music, would cause me to abandon online services like Spotify that also boasted 30 million songs. Not an Apple acolyte, I use a Windows computer and an Android smartphone. I boycotted buying

anything from iTunes when a \$50 credit in my account was hacked and Apple refused to restore it the second time it happened. But I also own an iPod touch, two iPads, and an Apple TV, and the iTunes Store on my PC continued to

be the place for sampling free music—typically after discovering the songs on radio stations streamed on iTunes.

I couldn't ignore Apple's offer to new users of getting the first three months of service for free, so I bit. Upon installing the

When I saw an article about how hip-hop was the new oldies, it was time to take a listen.

app on my iPad mini, Apple Music asked me to "tell us what you're into." You tap twice on genre circles you love to start customizing its recommendations.

Sometimes I find it hard to break free of Steely Dan handcuffs. So when I saw a magazine article about how hip-hop had become the new oldies, I figured it was time to take a listen. Nothing could be easier than reading the song titles the article mentioned aloud to Siri, Apple's voice assistant. As I curled up with Siri on the couch in my home theater in front of my Airplay-connected A/V receiver and big speakers, I realized that no other streaming service came close to incorporating such an effortless command interface.

If Siri was surprised when I told her to play "I Get Around" by 2Pac, she didn't bat an eye. She responded accurately most of the time when I added "Hey Ya!" by



Outkast, "Return of the Mack" by Mark Morrison, and "Make You Sweat" by Keith Sweat. You can say things like "Play anything by Van Morrison" or "Play the top hits of 1995."

An advantage to using Airplay through an Apple TV over my Pioneer receiver was that album art displayed on the screen. More can be expected once Apple TV gets a native Apple Music app this fall.

If embedding Siri were the only thing Apple brought to the party, I'd be impressed. Another plus is that Apple Music tightly integrates with your iTunes music library. If Neil Young happens to remove "Driftin' Back" from the service but you've ripped the CD to your iTunes Library, Siri will find it and play it. As with other premium services, you can download songs into your mobile device's internal storage for off-line use, though unlike a paid download (conveniently available through the iTunes Store), they'll go away with a lapsed subscription.

I enjoyed Beats 1, Apple's 24-hour radio station with live DJs in Los Angeles, New York, and London. Its retro feel mixed the right amount of informed human chatter with commercial-free music. Apple Music is expected to be available on Sonos systems and Android devices this year.

I sometimes got lost in Apple Music's screen clutter but eventually learned to navigate my way around. Apple Music streams in the AAC format at 256 kbps—the same as an iTunes download but slightly less than Spotify's 320 kbps stream and considerably less than Tidal's HiFi tier of 1,411 kbps. In a listening comparison, songs on Tidal sounded noticeably richer, but at \$19.99 a month, it's a much pricier option than Apple Music's \$9.99 a month plan (matched by Spotify Premium) or \$14.99 for a family of up to six people. Unlike Spotify, there's no free, ad-supported version. At the end of my free Apple Music trial, I resolved to become a paying customer.

TV Makers Testing Next-Gen A/V Tech

Major TV manufacturers are collaborating in field tests that would bring a new ATSC 3.0 television broadcast standard, which would include a new IP-based Ultra HD video standard and a broadcast- and streaming-friendly surround standard.

One part of the forthcoming broadcast standard is the "physical layer," or transmission technology. One possible candidate, Futurecast, has moved into the second phase of testing by its developers: LG, its Zenith division, and GatesAir, a manufacturer of broadcast transmitter equipment. The system can accommodate everything from fast-moving vehicles in city centers to indoor locations to rural areas up to 50 miles away. Futurecast is said to be good at resisting multipath reflections from tall buildings, traditionally a bane of TV broadcasting.

Meanwhile, Samsung is getting together with Pearl TV—a consortium of nine companies that own TV stations—to test a preliminary version of ATSC. Also participating is Sinclair, another major TV station owner. "We need a new standard for the next generation of broadcast UHD TV," said Samsung's John Godfrey, adding that "it is now time for the industry to step forward with technical and consumer testing." The tests are expected to stretch over the next 18 months.

The ATSC 3.0 standard will also have an audio component, and that's being tested as well. Dolby AC-4 supports 5.1-channel surround; plus dialogue enhancement, intelligent loudness, and dynamic range controls; and is appropriately bandwidth-efficient for broadcast use. Harmonic, a video delivery infrastructure company, participated in the first U.S. test of AC-4 with KQED, a PBS affiliate in San Jose, California. The test used Harmonic's Electra X2 media processor for real-time audio and video encoding. AC-4 has also been used experimentally in a couple of French sports broadcasts.

Sony and Vizio have already endorsed Dolby AC-4 and are planning to build AC-4



audio decoders into the ATSC 3.0 tuners of future TVs. However, the Dolby technology is not the only one vying for acceptance in ATSC. There is also an MPEG-H technology being promoted by Fraunhofer, Qualcomm, and Technicolor. DTS also offered, but withdrew, a technology of its own.

The Advanced Television Systems Committee is expected to finalize its new broadcast standard in 2017.—MF

M U S I C A L B A S S

BalancedForce Woofer Configuration | 3400 Watts Peak | Custom Low-Pass Filters | Room Correction



BALANCEDFORCE™ [212] | BALANCEDFORCE™ [210]

Conventional subwoofer enclosures vibrate in reaction to driver activity, contributing considerable distortion to bass. Not the BalancedForce 212! Its 12-inch drivers and dual 1700-watt (peak) amps flex extraordinary muscle yet operate in exact opposition, eliminating cabinet vibrations. Atop the cabinet, a nickel balanced on end will remain perched on edge during even the most forceful bass passages. A fine balance to be sure. Not surprising as MartinLogan has never taken a conventional approach to pursuing perfectly musical bass.

martinlogan.com

Specs provided are for the BalancedForce 212.

PBK
READY


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Truth in Sound



No matter what you listen to inside the entirely new Lincoln MKX, the one thing you won't hear is compromise.

We could have simply put speakers where everyone else does, rather than using Point Source Architecture to give you optimal dispersion and consistent sound quality throughout the cabin. We could have reserved the extraordinary dynamic range of the 20-channel, hybrid amplifier for your home theater instead of a luxury vehicle. We could have used standard grilles rather than precision-milled, aluminum ones that were tested and retested to achieve the perfect balance of style and transparency. We could have taken the easy road. Instead, Lincoln embarked on an exclusive collaboration with Revel® to create the Revel Ultima™ System*—so you could enjoy an immersive, mirror-to-mirror musical image while you're out on the highway. Lincoln.com/RevelAudio



THE LINCOLN
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Pictured here: Lincoln Black Label MKX Thoroughbred. Available at participating Lincoln Black Label dealerships only.

New Gear

THIS MONTH'S HOT STUFF...

► Middle Atlantic PD-28-SP Series Protection Compact Surge Protector

If you've ever lost A/V gear in the wake of a hellacious thunderstorm, then you know the value of power protection. The patented PD-28-SP is hailed as the "most compact surge protection device in the industry." Looking more like a car stereo amp than a surge protector, the 8-amp device protects connected components against potentially debilitating over- and under-voltage conditions and resets automatically after a power event. Over- and under-voltage cutoff thresholds are 135 VAC and 100 VAC, respectively. **Just How Small?** The two-outlet device is only 1.75 inches tall, 4.5 inches wide, and 9 inches deep, making it ideal for installation in tight spots—like behind a flat-panel TV (mounting bracket included). **Price:** \$270
Middle Atlantic • (973) 839-1011 • middleatlantic.com



► Klipsch Atmos-Enabled Reference Premiere Speakers

Early this year Klipsch debuted the most comprehensive "revision" of its flagship Reference Premiere speaker series, and now it has taken the update a step further with two Dolby Atmos-enabled models: the 43-inch-tall RP-280FA tower, featuring a walnut veneer finish and integrated height speaker, and RP-140SA elevation speaker, which adds height capability to existing speaker systems to make action-packed movies like *John Wick* all the more menacing. Both models are high-efficiency designs featuring Cerametallic woofers and a titanium tweeter loaded in a proprietary Tractrix horn.

Bounce It: Off the ceiling, that is. The beauty of "Atmos-enabled" speakers is that they use precisely angled drivers to bounce sound off the ceiling, eliminating the need to install speakers up there. **Prices:** \$499/pair (RP-140SA), \$2,400/pair (RP-280FA)

Klipsch • (800) 554-7724 • klipsch.com

► Limited-Edition Queen by Rega Turntable

Rega was approached by the legendary rock band Queen to produce a limited-edition turntable to coincide with the recent release of *Queen: The Studio Collection*, an 18-piece box set from Virgin EMI Records (\$445) featuring 180g colored vinyl LPs. The group is apparently quite serious about getting it right: At the time of this writing, guitar god Brian May was putting the one-and-only prototype through its paces. Rega is building 2,000 turntables but making only 200 available in the U.S. (What are we, chopped liver?) **Regal Design:** Fitted with a hand-built RB101 tonearm and Rega Carbon moving-magnet cartridge, the turntable sports a black acrylic-laminated plinth with a "Queen by Rega" logo and a black and gold silk-screened platter inspired by artwork from the late Freddie Mercury. **Price:** \$650 (through [queenonlinestore.com](#) and [soundstagedirect.com](#))

Rega • (972) 234-0182 • rega.co.uk / soundorg.com

→ **Acurus Scorpion Multi-Zone Distribution Amp**

Compact, powerful, and easy to set up is how Acurus describes its new Scorpion multi-zone amp, which squeezes 16 active channels and two stereo preamp outputs into a svelte 3.5 x 19 x 15.75-inch chassis. Setup is accomplished using a built-in Web app and the amp's touch-sensitive control panel or a smartphone/tablet.

Music Everywhere: Ideal for medium to large homes, the amp delivers 2x50 watts of stereo power to each of eight rooms or areas (zones). Want tunes in 10 zones? Connect an external amp (or two) and press one or both preamp zones into action. Each zone can be independently driven or driven from one of two global inputs. Did we mention the five-year warranty? **Price:** \$3,599

Indy Audio Labs • (866) 781-7284 • acurusav.com



← **B&W Cinema 7 In-Wall/Ceiling Speakers**

Everyone knows Bowers & Wilkins makes some of the finest freestanding speakers in existence—so revered that you'll find them in places like London's fabled Abbey Road Studios. But did you know B&W also makes "custom installation" speakers meant to be installed in walls and ceilings? The Cinema 7 Series CCM and CWM speakers are designed to handle front left-, center-, and right-channel duties from the ceiling or wall, respectively. **Tweeting in Style:** A "Nautilus swirl loaded" aluminum tweeter is suspended above a 7-inch woofer in the CCM, while the rectangular CWM sandwiches the same tweeter between pairs of 4-inch drivers in an elongated 2.5-way design. With both models, grille covers attach magnetically and spring clamps make it possible to mount the speakers without tools. **Prices:** \$700 each (CCM), \$850 each (CWM)

Bowers & Wilkins • (978) 664-2870 • bowsers-wilkins.com



Laserizing the Competition

By Kris Deering

Epson PowerLite Pro Cinema LS10000 3D LCD Projector

PRICE \$8,000

LAST YEAR'S CEDIA EXPO WAS A bit of a buzzkill for projectors. We continued to see a dropoff in the number of manufacturers, and two of the biggest names in consumer projectors, Sony and JVC, both decided to forgo new models altogether. But that didn't stop Epson from unveiling one of the most exciting projectors I've seen in years, the PowerLite Pro Cinema LS10000. Not only is it unlike any previous Epson model, but it's also the first laser-driven home theater projector I've seen—and at a sub-\$10,000 price point. But can it compete with the juggernauts from Sony and JVC at these higher price levels? Let's find out.

New Kid on the Block

The first thing I noticed about the LS10000 was its massive chassis. I've reviewed quite a few Epsons over the years, and they typically have been more modest in size. The LS10000 is more like the bigger Sony projectors, with a case that approaches 2 feet in width and depth and a weight of nearly 40 pounds! This is also the best-looking projector I've seen from Epson over the years—very sleek, with large ventilation grilles flanking the lens, a flaked paint job, and a slick pop-out keypad to control the projector locally.

The back panel bucks the trend toward omitting analog inputs, as it features both

AT A GLANCE

Plus

- Laser light engine
- HDCP 2.2 compliance
- Excellent contrast and accuracy
- UHD color support

Minus

- Not true 4K
- Pricey
- Contrast not quite up to lofty claims

component and composite varieties. Two HDMI inputs are provided, one HDMI 1.4 and the other HDMI 2.0 with the latest HDCP 2.2 copyright management protocol. Epson also includes a PC RGB input, an RS-232 port, a LAN port, and a pair of triggers for automation.

Still, it's not what's on the outside that sets this projector apart from previous Epson offerings; it's what's inside. The LS10000 will accept a 4K source, displaying it in a pseudo 4K form using its 1080p imaging chips (more on this below). (An Epson sister laser projector, the LS9600e, deletes the faux 4K feature, offers marginally less specified brightness, but adds wireless Full HD capability

up to 1080p/60.) Other features, apart from the usual suspects, include powered lens adjustments, lens memory, frame interpolation, customizable gamma (which proved to be so quirky I abandoned using it), and panel alignment by zones (our sample was well aligned out of the box, so I didn't use this). Three gamut settings, HDTV (Rec. 709), EBU, and SMPTE-C, are selectable in the Advanced picture menu.

But perhaps most significant, Epson dipped their toe into two new (for them) technologies this time around, delivering not only the cutting-edge laser light engine but also a new reflective LCD panel device somewhat akin to the LCOS/SXRD-based technologies we've been enjoying from JVC and Sony.

Epson has long been the market leader in LCD-based projectors and actually supplies the LCD panels used in many other projector brands. LCD is a transmissive technology, with light passing through pixels that act like gates to

RATING

Epson PowerLite Pro Cinema LS10000

3LCD Projector

2D Performance ★★★★★

3D Performance ★★★★★

Features ★★★★★

Ergonomics ★★★★★

Value ★★★★



● Large ventilation grilles flank the LS10000's lens.

control the brightness. But LCOS (Liquid Crystal on Silicon) is a so-called reflective technology. While it also uses LCD imaging chips to gate the brightness of each pixel, in an LCOS design the light passes through an LCD panel, bounces off a reflective, silicon-based surface, then passes back through the LCD. This reflective configuration puts the electrical connections driving the pixels behind that reflective layer. This results in a higher "fill factor," which is the amount of space on the chip dedicated to the actual pixels relative to the spaces separating them. In a transmissive LCD design, the electrical connections can only be routed through larger gaps between the pixels. This results in the "screen door" effect that has almost become LCD's calling card. While it must be said that the fill factor of LCDs has improved significantly in recent years, reflective LCD designs still offer significant advantages in this regard. In addition, they typically offer higher contrast than LCD designs.

While similar in the above respects to LCOS, Epson describes the technology they've developed for the LS10000 as 3LCD reflective. They have leveraged their background working with quartz to use that material for the reflective substrate, rather than the silicon chips we've grown accustomed to from JVC and Sony (in its SXRD designs). These new 3LCD

THE VERDICT

Few projectors can compete with Epson's first salvo in the reflective LCD market, and the company's laser engine delivers bright images with flagship-level contrast and accuracy.

reflective devices are said to offer higher fill factor and superior native contrast performance as those established LCOS designs. While they don't quite provide the industry-leading native contrast performance that JVC has managed to deliver in recent years, they are more in line with the performance we've seen from Sony's SXRD panels.

To increase contrast performance, Epson's Dynamic Contrast feature dynamically modulates the laser to produce changes in brightness, much like the dynamic aperture we typically see in the best modern projector designs. This allows the Epson to deliver a true black by turning off the laser completely when required by the image. This control has three modes: Off, Normal, and High Speed.

While this feature works great for enabling an infinite full-on/full-off (sometimes called sequential) contrast, it doesn't really represent the native contrast capabilities of the projector. To check for this, I first measured the Epson's contrast ratio without any help from its Dynamic Contrast modes. This gave me an idea of the native contrast potential of the reflective panels. I tried a variety of different zooms and laser brightness modes (more on that later) and got full-on/full-off contrast results that ranged from about 14,000:1 to 21,000:1. That puts it in the same range as what I typically

measure from Sony's flagship designs.

The Epson also features a manual aperture that has a limited amount of range but bumps the contrast up a little bit without engaging a dynamic system. This aperture looks to be more for adjusting the amount of light you see on the screen than for fixing contrast, but it offered a modest improvement and brought this result up to almost 29,000:1.

Epson's Dynamic Contrast is one of the more transparent dynamic light-control systems I've ever seen. The Normal mode is less aggressive than what I've experienced with dynamic aperture designs, despite having about a 5-6x multiplier for its contrast performance. It is slower to fade to an absolute black, so image pumping is nearly nonexistent. But the best part is its lack of gamma pumping. Almost every dynamic system I've used displays occasional hiccups with transitions from dark to bright images or those in the middle range. My JVC DLA-X700 shows some obvious detail clipping and color smearing with some material, though it is pretty infrequent. Sony is a bit less aggressive, but I've seen pumping and clipping in some of my testing. The Epson, however, delivered a nearly artifact-free image in every test I conducted.

PROJECTOR

EPSON POWERLITE PRO CINEMA LS10000 3D LCD PROJECTOR

PRICE: \$8,000 (2 pair 3D glasses included)

Epson • (800) 463-7766 • epson.com



But the Dynamic Contrast isn't flawless. My friend Darin summed it up nicely when he compared the Dynamic Contrast feature to a staircase. With the laser off, the projector is fully capable of delivering the bottom step with a true absolute black. But once you turn the laser on to deliver the next step up, you find you've skipped a lot of stairs; the darkest native black of the reflective panels with the light source active remains quite a bit higher than true black. That leaves out a lot of gradation in between. Still, this is the case with most dynamic contrast systems. They do a great job of providing deep, deep blacks, but without high native contrast capability from the device itself, you end up with holes between their black floor and the next step up.

Despite this gap in how it handles the lowest reaches of dark gray to black, the Epson's Dynamic Contrast feature measured quite well. While I wouldn't say it's the king of contrast (that still belongs to JVC), this projector is punching like a heavyweight compared with most of what's out there today. I just hope projector manufacturers continue to improve the native contrast performance of their chips so that they fill these gaps over time. This will become even more important as we ride into the new world of High Dynamic Range (HDR) content.

As an example, one of my favorite test clips, from the film *The International*, is an interrogation scene that takes place in a dimly lit

room. I've seen a lot of projectors clip the highlights here, resulting in a total lack of definition in one of the actors' faces. I also usually see obvious pumping as the brightness of the image changes from dark to dim to bright. The Epson delivered this scene flawlessly with not a single artifact noticed, something I've never seen before, all while still delivering great shadow detail, blacks, and highlights. That isn't to say the system is totally transparent. For example, I could spot some minor clipping in the movie *Oblivion* in the scene where Tom Cruise gets the 411 from his captors as he's tied to a chair. This is a great torture test for dynamic contrast systems when the scene transitions between Morgan Freeman sitting in the dark and Cruise sitting under a bright spotlight. That time, although the Epson demonstrated modest clipping for a split second, it recovered faster than the reactions I've seen from JVC's and Sony's dynamic aperture systems.

With the Dynamic Contrast system engaged, there were also clear improvements in black levels. Darker material took on a more dimensional look, with solid blacks and outstanding shadow detail. I tried my best to measure the black performance before the laser would shut off completely, and I got somewhere in the range of 80,000:1 to 150,000:1 as the meter shifted, but it's hard to say where it stops before the laser shuts down. Overall, the Epson's picture doesn't match the JVC's for nearly black images, but I found the performance to be in line with my recollections of Sony's flagship

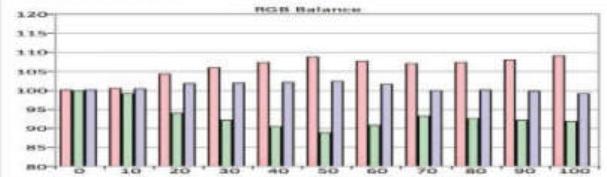


● The Epson's chassis is quite large, at nearly 2 feet wide and 40 pounds.

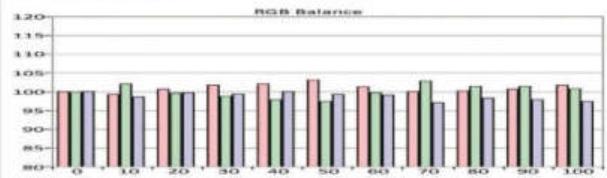
Test Bench

Epson PowerLite Pro Cinema LS10000 3D LCD Projector

BEFORE Calibration



AFTER Calibration



FULL-ON/FULL-OFF Contrast Ratio: Infinite (approx. 80,000:1 to 120,000:1 real world)

THE Epson PowerLite Pro Cinema LS10000 I reviewed had 480 hours on it. When I first turned it on, I restored all factory settings, to try to match the projector's original out-of-the-box status.

ALL calibration readings were taken with a Colorimetry Research CR-100 tristimulus colorimeter profiled to a Jeti 1211 spectroradiometer in CalMAN 5. A DVDO 4K TPG pattern generator was used for calibration, and the Spears & Munsil HD Benchmark, 2nd Edition Blu-ray and Ted's LightSpace CMS Calibration Disk were used for initial setup patterns and verification tools. All calibration was done off my reference 120-inch 1.78:1 Stewart Filmscreen StudioTek 100 screen, and contrast measurements were taken using a Minolta T-10 meter approximately 4 inches from the front of the lens.

ALL measurements were taken in the THX Color Mode preset with Power Consumption in Normal. The gamma preset selected was 1, which measured close to 2.4. All of the calibration was done with the lens iris at its 0 setting and the dynamic contrast function disabled. Contrast ratio measurements were done in a variety of different modes for the lens iris, as noted. The laser had 500 hours on it during the calibration.

THE highest native contrast ratio (Dynamic Contrast disabled) was obtained with the projector in High lamp mode and the lens iris fully closed. The highest contrast ratio achieved was 24,000:1. Using the Dynamic Contrast setting in either auto mode resulted in a true absolute black as the laser shut off, effectively making the contrast ratio infinite. As mentioned in the review, though, the more realistic usable contrast ratio for most material was closer to 100,000:1, with a scene-to-scene contrast closer to the native measured contrast of 24,000:1 (given the slower response of the dynamic system). I also did a rough ANSI contrast measurement using only the four internal squares of the pattern for reference and got an approximate value of around 210:1, which is a bit low compared with that of other projectors I've measured using this method. RGB and grayscale tracking out of the box were OK but not quite as spot-on as the results from other projectors I've measured in the past year. As noted in the review, I had a hard time getting the grayscale midpoints to balance properly. The projector would have benefitted from a multi-point grayscale calibration system like those seen in many flat panels today. The color gamut in the THX Color Mode preset was exceptional. I could fine-tune the color to nearly perfect levels but at the sacrifice of making saturation points below 100 less accurate, so I'd recommend not touching the color gamut. Luminance and saturation tracking were generally excellent as long as I left the CMS (color management system) alone.—KRD

SPECS

Dimensions (WxHxD, Inches): 21.65 x 8.85 x 21.77 • **Weight (Pounds):** 39 • **3D Glasses:** 2 pair included, extras \$100 each • **Video Inputs:** HDMI (1 Ver 1.4, 1 Ver 2.0 with HDCP 2.2), component video (1), composite video (1), VGA D-sub 15 pin (1). Other: 12v trigger out (2), RJ45 wired LAN (1, command and control only)

projector (VPL-VW1100ES, reviewed at soundandvision.com). The dynamic laser's High Speed mode, meanwhile, is quicker to go to absolute black than the Normal mode is. This works really well with the typical blackouts that occur between scenes, but it's distracting on opening titles or scenes where the image pans through complete darkness for a few brief seconds. The abrupt jump from the more natural black level of the projector to its absolute black with the laser off is a bit too jarring—reminding me once again of the staircase analogy where some intermediary steps are missing and it's an awkward tumble to the bottom. This mode works great for measurements, but I would avoid it in regular operation and stick with the Normal mode.

Faux 4K

Like JVC's most recent LCOS projectors, the Epson LS10000 uses a 4K "enhancement" technology to deliver 4K-like images while still using native 1080p panels. This is done by slightly and rapidly shifting the panel image diagonally to replicate another set of pixels. It tricks the eye into thinking there's more resolution than the native panels truly deliver. JVC's version, which I've been playing with for some time now, is called "e-shift."

I was lucky enough to have a Redray 4K player from Red with native 4K material on it to test this feature on the Epson. Native 4K images did look quite stunning, and the projector was considerably faster to lock onto the 4K video and less finicky with 4K than my JVC was. HDMI stability has been an issue with the last few JVC models I've tested, with the signal frequently cutting in and out. The Epson showed no signs of this. Nonetheless, Epson's 4K modes aren't quite as good-looking as what I see from my JVC.

This may be just a technology maturity issue, but Epson's 4K treatment has a slightly softer look. Although Epson tries to counteract this a bit with its "super resolution" feature, it doesn't solve the problem completely and ends up giving the image a bit of an overprocessed and edgy look. This isn't as obvious with native 4K material, but it was noticeable with 1080p material scaled to quasi-4K.

Another issue was image lag. If I scaled a 1080p signal to faux-4K using the projector, I experienced video delay that created issues with audio sync. Usually, I might compensate for this with the audio delay settings in an audio receiver or processor, but I couldn't get enough delay from my processor for a perfect sync. I eventually overcame this by moving the 4K scaling to my Oppo universal disc player and feeding the Epson a 4K signal that way, but this only works for Blu-ray and not for other sources you may want to watch using the 4K mode.

Therefore, I ended up using the projector's standard 1080p mode for my viewing, as I just didn't find the quasi-4K mode to deliver any real benefit on my 120-inch screen. I've said the same about JVC's e-shift mode as well. The pros just don't outweigh the cons with the vast majority of my viewing using native 1080p material.

Light-Years Ahead

Perhaps the most exciting piece of technology offered by the LS10000 is the new laser light engine. Laser illumination has been talked about for years, and aside from a cost-no-object 4K projector from Sony that's not geared to consumers, we haven't really seen any full-scale home theater projectors utilize the technology.

The Epson isn't a true scanning laser display, meaning it doesn't actually shine the laser directly at your screen. Instead, it uses two blue laser diodes that light up two phosphors. One phosphor creates blue light, while the other outputs yellow light. The yellow light is then split by mirrors into the red and green primaries. The final red, green, and blue light is sent to the reflective panels and then out of the lens.

Among the prime benefits of the laser light engine are stability and a long life. Three selectable Power Consumption modes are offered to adjust the laser's output: Eco, Normal, and High. Epson claims that the laser's life span for usability is rated at 30,000 hours in the Eco mode, which represents a massive improvement over traditional UHP bulbs, which typically last close to 3,000 hours at best before needing replacement to maintain good projector performance.

The LS10000's most exciting piece of technology is the new laser light engine.

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● The back panel, unusually, features analog inputs.

But in the laser's High mode, this long life span is truncated to about 17,000 hours. I wasn't able to get a specified life span for the Normal mode, which was my preferred setting during this review. It gave me a peak brightness of about 20 foot-lamberts on my 1.0-gain Stewart StudioTek 100 screen (120-inch diagonal) in mid zoom. That is far higher than what I've been able to achieve with my JVC in low lamp mode. I could actually bump this up a few foot-lamberts if I clipped bright highlights at reference white (digital 235) as well. And if I clamped down the manual iris, I could still get 15 ft-L without any white clipping at all! High mode bumped this up to about 25 to 27 ft-L, and Eco mode took me down to about 14 ft-L peak, which is still quite respectable and where I've been running my JVC.

The rated life span for UHP lamps is typically the number of hours to half brightness. They dim gradually over time. If laser technology holds its promise of stable output throughout its life span, this means I would have a constant brightness level from day one until the end of its life, with no concern for dimming or changes in the calibration once set properly. Obviously, we won't know if this promise proves true until we have a chance to measure projectors with more hours on the laser.

Another big benefit of the laser light engine is a wider potential color gamut. We've been living in the world of HD video for some time now, and that means the Rec. 709 range of colors. But with more Ultra HD content around the corner, there's a lean toward standardizing the wider P3 color gamut used in digital cinema. (The UHD standard also accommodates the even wider Rec. 2020 standard, though that's considered a little too ambitious for today's displays.) We've already seen a couple of projectors capable of delivering the P3 gamut using filters, and the Epson now joins these ranks. In addition to the selectable color

gamuts in the Advanced settings menu mentioned earlier, Epson has a specific Color Mode (picture mode) that engages a filter for its green light output to bring it into the P3 spec. This drops light slightly, but in my case, it still delivered more than enough for me to light up my screen to the 14 ft-L I desired in my setup. Of course, I didn't have any test material mastered in this color gamut, so I stuck with the THX preset for most of my viewing during this review. It delivered the most accurate image out of the box, with nearly dead-on color accuracy for Rec. 709.

One more advantage to laser is that you can turn the projector on and off at will, with no concern about damaging any components. The UHP bulbs employed in projectors are expensive parts and very sensitive to being toggled on and off, and manufacturers typically build in a delay that keeps the fan working after the lamp has been shut down to cool it off. You can't just turn a projector on and off and on like the flat panel televisions we're used to. No such problem here. All in all, I'm extremely impressed so far with the potential for laser light engines, and I hope to see this type of technology implemented across other brands.

Sharpening the Knife

Setup was a snap with the Epson. The menus are nearly identical to the ones on the Epson models I've used before, and as mentioned earlier, the THX preset was nearly spot-on out of the box. I did do some minor tweaking to the grayscale to get things in order. This was actually the third Epson LS10000 that I calibrated. The first two were brand new and required only a few clicks to get things dead-on. This review sample came with nearly 500 hours already logged, and it proved a bit more difficult to calibrate. No matter what I did, it was nearly impossible to get the middle grayscale points to come in perfectly. They were still

quite close, but not spot-on as with the other two projectors I calibrated. The question remains: Is this from drift after nearly 500 hours, or was this phenomenon sample-specific? If it's from drift, then the claim of a stable source for the lifetime of the projector diminishes significantly, but without follow-up calibrations on the other projectors I looked at, it will be hard to know. Some trending data points are needed.

After I got everything dialed in, I enjoyed the LS10000 for a few weeks, running through my usual test material and some of the latest titles on Blu-ray in both 2D and 3D. Epson provides two pairs of their active shutter 3D glasses with the LS10000 (extras are \$100 each), and they were a cinch to link up to the projector via RF. I'm not a big fan of 3D, but the Epson delivered a pleasant 3D image using its THX 3D Color Mode preset.

This automatically puts the projector into its High Power Consumption mode for the laser, and the image looked correspondingly bright. I did notice some occasional ghosting (as I've come to expect from just about every projector aside from DLPs), but it was pretty infrequent, and I didn't find it overly distracting. The image looked a bit washed out and flat compared with my 3D viewing via my reference JVC, though, which I attribute to the lower native contrast. Still, the 3D performance was considerably strong overall and in line with that of most other projectors I've used at this price point.

In my 2D tests, I went through a

multitude of different titles on Blu-ray and was constantly impressed by the image from the LS10000. Highlights included the recent Blu-ray release of *Lucy* from director Luc Besson. This is by far one of the best video transfers I've seen on Blu-ray and an absolute stunner for showcasing reference-quality video. The Epson was razor-sharp and showed incredible depth, dimension, and detail throughout. Colors popped from scene to scene, and black levels were always satisfying. The animated film *The Book of Life* was another great treat. The animation style is quite different from what we typically see in CG animation, but it made for some demo-quality sequences with great contrast and definition.

The New Elite

It's great to see a company still pushing innovation in the projector market. The LS10000 is one of the most exciting products I've reviewed in some time, and I can only hope that other manufacturers will step up their game in response to it. Given this projector's support for next-generation copyright protection and a wider color gamut, it's an easy recommendation for those looking for a longer-term projector to get them through UHD's infancy, until we see models start to offer more advanced features like reasonably priced native 4K and HDR content support. I'm also impressed by just how well Epson has combined so many new technologies. I ran into almost no problems with setup, and the image was up there with the best I've seen. At \$8K, this isn't a budget design, but it competes well with almost everything at or above this price point. If you're in the market for a showcase projector with some compelling next-generation features, look no further. ♦



● The LS10000's remote is a standard backlit model.

The image was up there with the best I've seen.

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- Andrew Williams



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Truth in Sound

By Michael Trei

MartinLogan Motion 60XT Speaker System

PRICE \$6,695 as reviewed

COMING UP WITH A GOOD slogan for your company can be tricky. You want something that tells people what you do, but you don't want it to tie your hands as the company evolves. For years, Burger King ran commercials using the catchphrase "Have It Your Way," but they had to drop it when they wanted to reduce the bottlenecks being caused at restaurant counters by custom orders. Now they're back to being the "Home of the Whopper." Of course, you could simply ignore the historical inaccuracy of your catchphrase, as the H.J. Heinz Company has done; after all, they probably have 5,700 varieties today, not just 57.

MartinLogan ran into this problem a few years ago when they wanted to introduce their first speakers that didn't use any electrostatic drivers. I suppose they felt that "The Electrostatic Loudspeaker Technology Company" just wasn't going to work as they expanded into other driver technologies. Now they use the all-encompassing slogan "Truth in Sound," which should keep them covered unless they start making toasters.

The latest non-electrostatic products from MartinLogan use their Folded Motion XT tweeter, a new, larger version of the Folded Motion tweeter that's included in all of the Motion series speakers. This is the company's take on the air motion transformer (AMT) driver invented by Dr. Oskar Heil more than 40 years ago. AMTs have seen a surge in use in recent years, probably due to the

expiration of several of Dr. Heil's patents. MartinLogan says that their Folded Motion tweeter shares many sonic qualities with their electrostatic panels; the large radiating area results in less driver excursion and potentially lower distortion than that of a typical dome tweeter.

With all of this exotic tweeter technology, it would be kind of

disappointing if MartinLogan chose boring traditional drivers for the rest of the speaker. While the cones used for the Motion midrange and woofer drivers may look pretty ordinary at first glance, a closer look will reveal that they're made from aluminum rather than the more common plastic or paper. This, of course, makes them incredibly rigid, although the higher mass means you need a big magnet structure to keep the driver's motion in check.

MartinLogan sent a complete



● The Motion series is available in piano black as well as the black cherrywood pictured here.

RATING

MartinLogan Motion 60XT Speaker System
Performance ★★★★★
Build Quality ★★★★★
Value ★★★★★



AT A GLANCE



Plus

- Powerful, punchy sound
- Excellent sonic match among speakers
- Fine upper-octave detail



Minus

- Clunky interface for Perfect Bass Kit
- Marketing not withstand-ing, they can't image like ML's dipole speakers

5.1-channel system for this review, tapping the top-of-the-line Motion XT (which stands for "extreme") models from the Motion series. For the main left and right speakers, we received the big three-way Motion 60XT floorstanders (\$3,000/pair), which were matched up with the two-way Motion 50XT center speaker (\$900) and, for surround duties, a couple of the two-way Motion 35XT bookshelf speakers (\$1,200/pair). Rounding out the package was the 1500X subwoofer (\$1,595) from the Dynamo series, bringing the cost of the entire system to \$6,695. That sounds like a lot, but when you see each of the Motion XTs in the flesh, it's instantly clear that you're getting a whole lot of speaker for your money.

All of the speakers share a common design aesthetic, sporting a deep and glossy piano-black finish (black cherrywood is also available), with nicely beveled edges and a top that slopes slightly down toward the rear to reduce the overall boxiness of the speaker's appearance. The front baffles have a satin black finish that matches the cone drivers more closely, but I felt that the speakers looked better when the perforated metal grilles were installed. These are held on magnetically, and they have



THE VERDICT

While they don't have much in common with MartinLogan's electrostatic offerings, the Motion XT speakers let you keep a foot in both the music and home theater camps with little compromise.

an indented area that matches the tweeter location to set it off from the rest of the speaker. The whole look displays a kind of urban chic that I wouldn't expect to see from a company based in Kansas, although that's probably just my New York City prejudices rising up inappropriately.

Setup

All of the speakers have biwire- and biamp-capable speaker terminals, using MartinLogan's sweet tool-less binding posts. These allow you to connect just about any thickness of wire with ease, using spade, banana plug, or bare wire terminations. A pair of metal jumper plates is included to join the binding posts together for a single wire connection.

The Motion 60XT tower speaker comes with a set of small rubber feet installed, which is fine if you have a flat, level floor and no little kids or pets running around who might be tempted to knock it over. For carpeted floors or rooms with other hazards, a pair of metal outrigger-like bars can be attached, which expands the speaker's footprint and adds carpet-piercing leveling spikes.

It's All About That Bass

The Dynamo 1500X subwoofer, which has the same glossy black finish as the Motion XT speakers (satin black is also available), is unusual in that it can be adjusted so that the 15-inch driver fires either downward or forward, depending on the installation. MartinLogan suggests using it as a downward-firing sub when it's free-standing in the listening room but says the forward-firing position is preferable when it's mounted inside a cabinet. I used it out in the room in my usual subwoofer spot, so I

kept it with the driver pointed down. Inputs include a balanced XLR input in addition to the typical pair of single-ended RCA jacks. The power switch can be controlled by a low-voltage trigger, or set to switch on when it senses a signal, but there's no permanently "on" setting. I found that the signal sensor worked quickly and silently, so this wasn't a problem.

MartinLogan also supplied their Perfect Bass Kit (PBK) subwoofer-tuning setup system, which includes a calibrated USB microphone (with a fancy tripod stand) and a PC software package that fine-tunes the sub's response in the room. In my customary setup, I use a manual dedicated subwoofer equalizer to tame the peaks and dips in my room, but the PBK is designed to automate that process.

Getting the PBK to work properly proved to be a challenge. With its clunky software interface and its requirement for a computer with two available USB ports, the whole thing looks and feels like it was designed about 15 years ago. I had to download the latest version of the software from the MartinLogan Website, and even then, I needed to put in a couple of calls to the folks in Kansas for technical assistance.

The good news is that once you have jumped through the hoops required to get it running, the PBK works well, allowing you to measure the bass response at up to 10 points in the room and providing graphs of the response before and after

MARTINLOGAN MOTION 60XT SPEAKER SYSTEM

PRICE: \$6,695 (60XT, \$3,000 pr; 50XT, \$900; 35XT, \$1,200 pr; **Dynamo 1500X**, \$1,595)

MartinLogan • (785) 749-0133 • martinlogan.com



somewhat, but despite MartinLogan's marketing pitch, you're never going to match the enveloping spatial effects of a dipole.

Killer bass, great imaging, and a huge soundstage are always fun, but I find that a balanced, transparent midrange and detailed, natural high frequencies are far more important when it comes to enjoying music. Here, the Folded Motion XT tweeter and aluminum-coned midrange driver give the Motion 60XT a clear edge, allowing great insight into the tonality and texture of each instrument. For example, the raw, dark tone of Jonny Lang's custom Fender Thinline guitar on his *Live at Montreux* DVD was easy to differentiate from the sound of his bandmate's more conventional Telecaster.

I also set up the smaller Motion 35XTs on stands as a stereo pair and found that their presentation was very similar to their floorstanding brothers'. The tonal match was pretty much spot on, just with the bottom bass octave missing and a little less dynamic swing. The 35XTs also use the bigger XT version



● The towers, bookshelf, and center share ML's Folded Motion XT tweeter.



TEST REPORT

RATING

MartinLogan Dynamo 1500X Subwoofer
 Performance ★★★★★
 Features ★★★★★
 Build Quality ★★★★★
 Value ★★★★★

- The Perfect Bass Kit comes with a calibrated microphone and tripod.



of the Folded Motion tweeter, so you get all of the same clarity and fine detail, giving a clear window into the recording. Bookshelf speakers hijacked for surround duties tend to get lost in a system review, but at \$1,200/pair, the Motion 35XT deserves respect as a great monitor-style speaker for a not-too-crazy price.

All Together Now

Putting the whole system together, I loaded up the dream scene from *Inception* where Leonardo DiCaprio and Ellen Page are sitting at an



- The 50XT center houses the same woofer and tweeter as the 35XT surround.

outdoor cafe, and everything around them starts to explode. With the Dynamo 1500X handling the thunderous bass rumble of each explosion, the Motion XT speakers were able to take all of the sounds of splintering wood and breaking glass and wrap them around the room in a seamless and effective way. I

normally use bipolar surround speakers, but even though the Motion 35XT is a direct-radiating box speaker, the envelopment felt complete. I'll put this down to the excellent timbral match among all five speakers, reducing any discontinuities as the sound swept around the room.

Summing Up

I generally find too often that a home theater system can be riddled with poor compromises when it comes to playing music; that's why I have completely separate systems for

two-channel and multichannel listening. The MartinLogan package does a pretty convincing job of straddling that divide, working quite effectively with both music and movies when set up appropriately.

Again, at around \$6,800 including the Perfect Bass Kit (\$100), this complete speaker package isn't exactly cheap, but you're really getting a whole lot of speaker for your hard-earned money. While I don't entirely agree with MartinLogan's claim that the panel-like Folded Motion XT tweeter shares a common design philosophy with the

company's electrostatic panels, it's an impressive achievement in itself, giving the Motion XT speakers a decisive

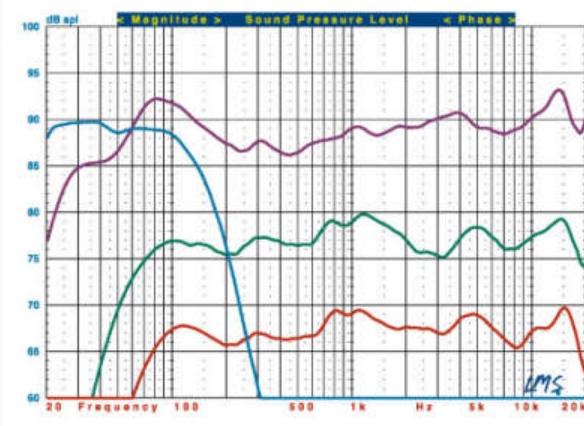


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Test Bench

MartinLogan Motion 60XT Speaker System



MOTION 60XT (purple) +2.20/-2.34 dB, 200 Hz to 10 kHz; -3 dB @ 42 Hz, -6 dB @ 25 Hz; impedance minimum 3.25 ohms @ 288 Hz, phase angle -56.10° @ 67 Hz; sensitivity 88.5 dB, 500 Hz to 2 kHz.

MOTION 50XT (green) +2.19/-2.43 dB, 200 Hz to 10 kHz; -3 dB @ 64 Hz, -6 dB @ 53 Hz; impedance minimum 3.10 ohms @ 1.7 kHz, phase angle -66.17° @ 98 Hz; sensitivity 91 dB, 500 Hz to 2 kHz.

MOTION 35XT (red) +1.95/-2.09 dB, 200 Hz to 10 kHz; -3 dB @ 69 Hz, -6 dB @ 59 Hz; impedance minimum 5.06 ohms @ 186 Hz, phase angle -49.11° @ 106 Hz; sensitivity 87 dB, 500 Hz to 2 kHz.

DYNAMO 1500X (blue) Close-miked response, normalized to level @ 80 Hz: lower -3 dB @ 19 Hz, -6 dB @ 17 Hz, upper -3 dB @ 130 Hz with Low Pass Filter control set to maximum.—MJP

SPECS

Motion 60XT: 8 in aluminum cone woofer (2), 6.5 in aluminum cone midrange, 1.25 x 2.4 in Folded Motion XT tweeter; 11.4 x 48 x 14.4 in (WxHxD); 66 lb • **Motion 50XT:** 6.5 in aluminum cone woofer (2), 1.25 x 2.4 in Folded Motion XT tweeter; 22.8 x 7.6 x 12.8 in (WxHxD); 30.5 lb • **Motion 35XT:** 6.5 in aluminum cone woofer, 1.25 x 2.4 in Folded Motion XT tweeter; 7.6 x 13.5 x 11.8 in (WxHxD); 18.5 lb • **Dynamo 1500X:** 15 in polypropylene cone woofer; 650 watts; sealed enclosure; line-level in; 12-volt trigger; 18.3 x 16.75 x 17.6 (WxHxD); 52 lb



advantage in clarity over many conventional designs. When you couple that with the allure of the aluminum cone woofers and midrange drivers, as well as the Motion's chic sense of styling, the overall package has great appeal. "Truth in Sound," indeed. ♦

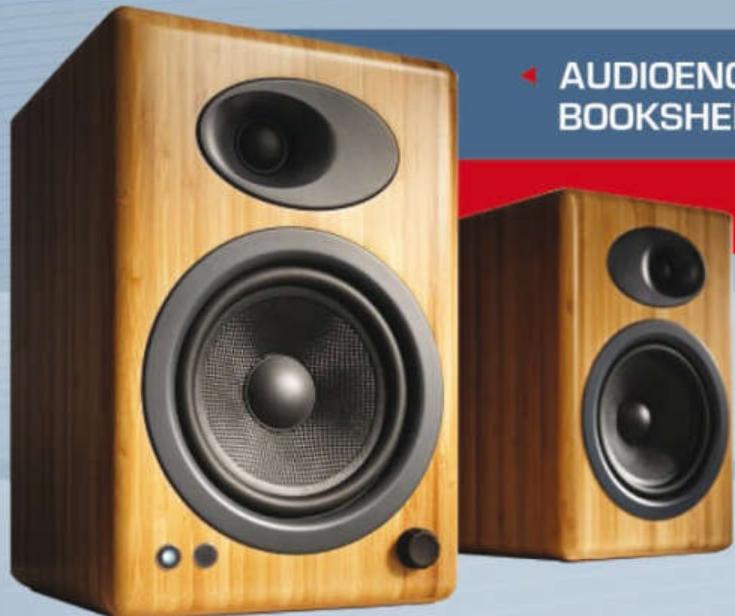
- The Dynamo 1500X sub can be positioned with the woofer firing down (shown here) or forward.

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The Little Sub That Could

By David Vaughn

Sunfire XTEQ10 Subwoofer

PRICE \$1,750

MY NAME IS DAVID VAUGHN, AND I'm a bass-a-holic. There isn't a 12-step program to cure me of this disease—and even if there were, I'd avoid the treatment like the plague. There's nothing like feeling the thump in your chest when an explosion rocks the room in the latest Hollywood blockbuster or hearing the windows rattle to some classic rap from the early 1990s. (Hell, who would have ever thought that "classic" and "rap" would go together in the same sentence?)

Traditionally, the easiest way to ensure powerful bass was to build a large, rigid enclosure, put a big woofer in the box, supply it with as much amplification as you could afford, and then let it thump away. The only negative to such a bass behemoth is that it may not be welcomed into the typical home's décor, except perhaps hidden in a bachelor pad or a man cave, and after 25 years of marriage, I have neither.

For legendary industry veteran Bob Carver, however, a large box wouldn't do. So back in the mid-1990s, he developed the Sunfire True Subwoofer, an 11.5-inch cube. It could produce what seemed like a ton of bass from that small enclosure thanks to custom voice coils, oversized magnets that produced High Back EMF (electromotive force), and a clever Tracking Downconverter Amplifier that could dynamically adjust its power supply based on the incoming signals.

Carver eventually sold Sunfire to Nortek in 2005, but his subwoofer breakthroughs have left a legacy with the brand, which continues to use his design philosophies to this day. Sunfire's latest XT subs come in three flavors, the XTEQ8, XTEQ10, and

AT A GLANCE**Plus**

- Small form factor is décor friendly
- Satisfying bass response

**Minus**

- Can't deliver the sonic impact of a bigger sub
- Better values can be found in the market

XTEQ12, with the number signifying the size of the drivers in each.

Don't Judge Me by My Size

Sunfire sent me the XTEQ10 for this review, and when it finally arrived, I was shocked at the weight and density of the package for such a smallish box. Inside was the subwoofer, power cords (both American and European), a microphone for the Auto EQ, and a surprisingly heavy mic stand. The sub itself was secluded in its own suede-like bag to protect its beautiful high-gloss piano-black finish, which showed absolutely no flaws. In fact, I've seen worse paint jobs on some luxury cars. In a nod to build quality, the XTEQ line comes with a five-year parts and labor warranty.

The XTEQ10 has two 10-inch drivers (an active woofer and a passive radiator) with Sunfire's High Back EMF and Asymmetrical Cardioid Surround (ACS) designs as well as a 2,700-watt Tracking Downconverter Amplifier. It measures 12.75 x 11.5 x 11 inches, practically the same as Carver's True Subwoofer from nearly 20

years ago. The enclosure sports Sunfire's trademarked Anti-Walking Tread Design Feet (so it resists moving around the floor while it's pounding out the bass) and weighs in at an impressive 54.5 pounds. The Auto EQ does an exceptional job of integrating the sub into your room.

The jack pack includes a stereo pair of RCA inputs, two line-level outputs (with a high-pass or full-range switch), a slave input and output to simplify the hookup and operation of multiple XTEQ subwoofers, a balanced XLR input, and a 12-volt trigger input, as well as the mic input for the Auto EQ. There are dials for crossover frequency, phase control, and volume level along with a switch to manually engage/disengage the EQ.

If you care to run dual XTEQ subs—which would be a very good idea if you have a larger room, connecting the slave output from the first subwoofer to the input of the second allows the second sub to receive the processed audio signals

RATING**Sunfire XTEQ10 Subwoofer**

Performance

Features

Build Quality

Value

from the first. Although I wasn't able to test this feature on this particular sub, in the past I've reviewed a pair of Sunfire subs that had the feature, and it worked as advertised.

In their well-written manual, Sunfire recommends that you experiment with various placements in your room. That's always a good idea. In my opinion, the best way to determine where to put a sub is to place it in your main listening position, cue up a bass-heavy track (I prefer Joss Stone's "Sleep Like a Child"), and then walk—or, better yet, crawl—around the room until you find the spot that provides the best bass response. For my room, it ended up being the front left corner, where my SVS PC Ultra sub usually resides.

I recently remodeled my room for Dolby Atmos and lowered the room's volume from more than 5,000 cubic feet to approximately 4,500. [Ed Note: You can read about David's renovation and see pictures in his two-part diary at soundandvision.com; just search "Atmos Makeover" or look under Custom Install How-To in the drop-down menu.—RS] In addition, I acoustically treated the room for maximum performance, and my current audio setup is the best I've ever owned. My reference speakers are three M&K SS150s across the front, four M&K SS150s for the sides and rear, and four in-ceiling Atlantic Technology IC-6 OBAs for Atmos. I use a dual-subwoofer setup



The Auto EQ does an exceptional job.

● The XTEQ10 houses a 10-inch woofer plus a 10-inch passive radiator.

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Myron Ho
HomeTheaterReview.com



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SUBWOOFER

- The jack pack includes a slave connection for use with multiple subs.



that currently includes the aforementioned SVS along with a Hsu Research VTF-15H MK2.

My wife likes to tell me that my dual-sub setup has an unsatisfactory "Wife Acceptance Factor," and when she first gazed upon the XTEQ10, she was very impressed by not only its glossy black cabinet but also its more décor-friendly size. It certainly doesn't draw attention to itself like the SVS and Hsu subs. But could it hang with the big boys?

While the XTEQ10 has its own crossover, I chose to use the 80-hertz crossover in my Marantz AV-8802 surround processor, which works well with my M&K speaker system. I then ran through a series of test signals to see if there were any shortcomings with the out-of-the-box setup, and I was pleasantly surprised to hear consistent output from 16 to 80 Hz—pretty impressive for such a small box.

After I listened to the sub for about a week without its built-in EQ, I decided it was time to see what the Auto EQ could do to improve the sound. The Sunfire manual gives step-by-step instructions for the EQ process, and they were simple to follow. The entire setup routine takes only a couple of minutes, and the results are definitely worth the effort. If you find the Auto EQ lacking, you can manually adjust the EQ of four different frequencies (35, 49, 64, and 84 Hz) by following the instructions in the manual. I tested how this worked—and it did—but I reran the Auto EQ afterwards because I was so impressed with its stock results.

If you have an AVR or surround processor with its own flavor of room EQ, Sunfire recommends you run their Auto EQ first and then run the

THE VERDICT

Given the Sunfire's dainty size, I didn't expect much, but it delivers in spades with music and should be adequate with movies for many listeners.

EQ in your processor. I found that this worked extremely well with my setup.

Gentlemen, Start Your Podracers!

I've been a fan of *Star Wars* since the first movie debuted on my birthday in 1977, and I'm one of the rare fans who don't mind the prequels. One of my favorite scenes from *Episode I: The Phantom Menace* on Blu-ray is the prolonged podrace. The action is certainly intense, and there's a copious amount of bass, which always helps. I've listened to this countless times with my dual-sub setup, and whereas I was certain the Sunfire would be no match for that scene, I was curious to see if it could still provide a satisfying listening experience.

Out of the gate, I gave the XTEQ10 props for filling in the bottom end of the audio spectrum admirably, but its bass response clearly didn't have the impact that a bigger sub (or two) could provide. For example, when Sebulba's podracer whizzes by, there's a deep drumming sound that I can usually feel rocking through my subfloor straight into my seating position. With the Sunfire, I could hear the thump but couldn't feel it.

The same could be said about the opening sequence of *Toy Story 2*, where Buzz Lightyear enters the atmosphere in search of Zurg's hideout. When he engages his after-burners, I can usually feel the impact of the sonic boom, but in the case of the Sunfire, it could only be heard—and not quite as loudly either.

Somewhat disappointed, I decided to run some in-room SPL measurements at specific frequencies and found that my SVS is capable of delivering substantially more output at 20 Hz, which is why I could feel the bass with the SVS subwoofer and only hear it with the Sunfire.

The differences between these two subs are less apparent on music, though. In fact, in many ways, I preferred the Sunfire because the bass was tighter on some tracks. I've been on a Train kick lately and can't seem to get "50 Ways to Say Goodbye" out of my head. The song starts with a mariachi band before the bass track kicks in and its

SUNFIRE XTEQ10 SUBWOOFER

PRICE: \$1,750
Sunfire • sunfire.com

Test Bench

Sunfire XTEQ10 Subwoofer



CLOSE-MIKED RESPONSE, normalized to level @ 80 Hz: lower -3 dB @ 25 Hz, -6 dB @ 23 Hz, upper -3 dB @ 93 Hz with FREQ control set to maximum and room correction disabled.—MJP

SPECS

10 in woofer, 10 in passive radiator; 2,700-watt Tracking Downconverter Amplifier; line-level stereo in/out, slave out, balanced mono input, mic in; Auto EQ; 12.75 x 11.5 x 11 (WxHxD); 54.5 lb

free-flowing spirit starts to shine. The XTEQ10 was extremely musical and never left me wanting in any way—and at levels needed to rock out, the 10-inch active woofer was pulsating like a madman.

Conclusion

As a movie aficionado who will endure the crappiest of titles just to experience the soundtrack's outstanding bass response, I am definitely a bass addict. I also have a large listening room. As such, my requirements in a subwoofer are above and beyond what the Sunfire XTEQ10 can deliver. That's not to say it's a bad subwoofer by any means; it just doesn't fit into the box (pardon the pun) that suits my personal needs. I need a sub (or two) that can rattle the windows, shake the floor, and (to borrow the words of my colleague Darryl Wilkinson) "threaten to liquefy your bowels." That's something this

tiny sub just can't do. Furthermore, when you look at the cost of the Sunfire, you can get just as much bass performance from slightly larger enclosures for a good deal less money. Granted, they probably won't have the fit and finish of the beautiful piano-black cabinet or the design background of Bob Carver, though if you're going to hide the sub behind a plant in the corner of the room, it may not matter. On the other hand, for those special situations where size or cosmetics really do make the difference, this Sunfire could be just what you need to get in the game. ♦



● At 12.75 x 11.5 x 11 inches, the XTEQ10 is similar in size to Sunfire's original True Subwoofer.

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The Duchess of Cambridge

By Mark Fleischmann

Cambridge Audio CXR120 A/V Receiver

PRICE \$2,399

AT FIRST GLANCE, THE COSMETIC difference between Cambridge Audio's new CXR receivers and the company's previous Azur line is almost shocking. The older receivers were stellar performers, but their look was strictly utilitarian, even a bit dowdy. They were the consumer electronics equivalent of Queen Elizabeth II. Whatever her traditional virtues may be, she hasn't won many beauty contests lately. What a difference a new look makes! The CXR receivers have a cleaner, sleeker front panel, with fewer controls and a generously oversized display. They're less QEII, more Kate Middleton—who, coincidentally, is also known as the Duchess of Cambridge.

Full Disclosure Specs

The CXR120 (\$2,399) is one of two new Cambridge receivers, the other being the CXR200 (\$3,299), which has twice the rated power. The Azur name has been retired. While CXR receivers still use fan cooling, it's a new design with new components. Using the industry-standard (if slightly deceptive) method of power rating, the CXR120 offers 100 watts into 8 ohms with two channels driven. At 6 ohms, that rises to 120, and at 4 ohms, 155. In an unusual and praiseworthy step, Cambridge also specifies the receiver at 60 watts into 8 ohms with all seven channels driven. That is the kind of information that most manufacturers prefer to conceal. Compare it with

AT A GLANCE	
+	Plus
■	Nuanced, open, uncolored sonics
■	Stream Magic module
■	Auto setup imposes no room correction
-	Minus
■	Bluetooth requires adapter
■	A \$2,400 AVR with no Dolby Atmos or DTS:X
■	Auto setup imposes no room correction

our Test Bench measurements—and competitive AVRs.

Cambridge has dramatically reduced the number of buttons on

the front panel. The old same-priced Azur 651R had 22 buttons. The CXR120 has eight, and seven of them are cunningly camouflaged, tucked into the four corners of the large display. When the receiver is powered down, you hardly notice them—but when it's powered up, the backlit legends pop up brightly. If only I could be that cheerful when I wake up in the morning.

The pair of buttons in the lower right corner are home menu and back keys. In an inspired touch, the volume knob scrolls up or down menu items; press the knob for enter. Brilliant! While I've seen this before, I haven't seen it often enough. Two other keys cycle among sources. The remaining controls operate the direct modes and the tuner. Yes, older Cambridge receivers offered more front-panel functionality independent of menus,

but their control layouts were harder to learn. The new ergonomic choices make it simpler to find what you need.

The cosmetic redesign extends to the graphic user interface. The new look, like the old one, is mostly monochrome except for a speaker-setup diagram in color. But the font is more attractive and smaller, presumably sized for a large HD screen. The remote distinguishes controls by shape but, oddly, not by color. The home menu and volume buttons are both integrated into the ring surrounding the navigation controls, which is convenient but takes some getting used to.

There's always a tradeoff between features and performance at a given price point. To reserve more pounds sterling in the design budget for audiophile-grade build quality, Cambridge has passed over some high-profile features that other manufacturers deem indispensable. Dolby Atmos and DTS:X, the new object-oriented surround standards, are nowhere in sight. Cambridge agrees with Dolby and myself that the 7.1.4 configuration is better for Atmos, which would require an additional pair of amp channels. The receiver can derive front height channels using Dolby Pro Logic IIz processing, but that's no substitute for decoding discrete Atmos soundtracks. Also



RATING

Cambridge Audio CXR120 A/V Receiver
Audio Performance ★★★★
Video Performance ★★★★
Features ★★★★
Ergonomics ★★★★
Value ★★★★

THE VERDICT

This receiver makes idiosyncratic audiophile choices—omitting Atmos, Bluetooth, and other features—but the revamped look and feel are great, and the sound is reliably musical.

missing: any form of automatic room correction EQ, though an auto-setup routine is present.

An increasing number of manufacturers are integrating Wi-Fi, Bluetooth, and AirPlay while eliminating extra-cost adapters. Cambridge does bake in Wi-Fi, including a supplied antenna, but Bluetooth requires the BT100 adapter (\$109). If you want AirPlay, buy Apple's AirPort Express.

It's not that Cambridge is uninterested in audio streaming. The CXR120 includes the same Stream Magic module found in Cambridge's CXN and 851N network music players. As most receivers do, Stream Magic supports Spotify and streams lossless audio via Wi-Fi or Ethernet or from a USB hard drive. But it offers wider file support than some, benefits from regular firmware updates and improvements, and consolidates streaming and simple receiver control features in the Cambridge Connect app. The app is for both Android and iOS. One of the HDMI ports is MHL capable, though the USB port isn't iOS compatible—so Android users have the advantage in streaming with a wired connection.

This is one of the few receivers I've seen that entirely omits the HD component video interface—and the first I've seen that omits SD

composite video as well. Thus, Cambridge eliminates the need for an analog transcoder and scaler, simplifying the design and freeing up resources for sound-enhancing components. HDMI 2.0 is supported, not 2.0a, so you'll have to do without being able to pass HDR video to a 4K display. But the receiver does support Ultra HD at a 60-hertz frame rate, 4:4:4 color depth, and 21:9 widescreen passthrough—and it offers the updated HDCP 2.2 digital rights management, so it can pass copy-protected UHD.

Associated equipment included five Paradigm Reference Studio 20 v.4 speakers and Paradigm's Seismic 110 subwoofer. Signal sources included an Oppo BDP-83SE universal disc player, Micro Seiki BL-21 turntable, Shure V15MxVR/N97XE cartridge, the phono stage of a Denon PRA-S10 preamp, and an iPad mini retina. All movie demos were on Blu-ray Disc with DTS-HD Master Audio soundtracks.

Gimme Some Truth

What should an audiophile receiver sound like? Should it be rigorously neutral, or should it dole out a little extra gravy in the form of midrange warmth? Previous Cambridge

receivers tended toward neutrality, with highs that were refreshingly detailed but proportionate. The Duchess was no exception. The top end was open and uncolored. The receiver could muster decent bass, too, though this became a double-edged sword due to the lack of room correction.

As *Taken 3* got underway, I quickly noticed that the receiver required three-quarters of its volume scale to muster audible dialogue and action-movie-worthy effects in my relatively modest listening space and with my speakers of average efficiency. However, the way a volume control's range is calibrated is not an indicator of its actual power output capabilities; as usual, see what our measurements say. The Duchess was graceful and well behaved at volume peaks, smoothly integrating effects and remaining listenable under duress. Bass was as full and clean as a good amp should make it but lacked the sculpting I've gotten used to with well-executed room correction. I found that everything from the movie's copious explosions to Liam Neeson's tense, gravel-voiced fury—the nemesis of kidnappers everywhere—tended to detach and localize in the subwoofer. I compensated with a minor adjustment to the sub's volume control, preferring less bass overall to congested bass at certain frequencies.

The bass adjustments continued with *Blackhat*, a Chris Hemsworth hacker-thriller with an unusually bassy soundtrack. The opening scene punctuates a nuclear meltdown with throaty synth effects that bounded out of the speakers and especially the sub, prompting another lunge to the sub's volume control. But that was only one-tenth of the story. The other 90 percent was just how pleasurable even the most aggressive movie soundtracks could become via this timbrally reliable, dynamically assured receiver—even when it operated with the volume at 75 to 80 percent of the scale.

The alternately terrifying and wonderful historical events depicted in *Selma* showed how natural voices

A/V RECEIVER

CAMBRIDGE AUDIO CXR120 A/V RECEIVER

PRICE: \$2,399

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could sound with the receiver. The resonant tenor of leading man David Oyelowo, as Martin Luther King, Jr., fortunately didn't localize in the sub but did blend well into the acoustics of public speaking venues. The orchestral score leading to the second encounter on the bridge was warm and heart-tugging. More voices—notably John Legend and Common singing "Glory" and the massed voices singing "This Little Light of Mine" in a Folkways historical recording—allowed the receiver to deliver the goods musically, as it invariably did in the music demos themselves.

From Naples with Love

An SACD of Baroque chamber works by the Neapolitan composer Francesco Provenzale was unexpectedly arresting. This collection, *Amati Orrori: Lamenti & Cantatas*, is performed by the ensemble Echo du Danube, and the multichannel version—in 5.0, with active center but no LFE—gave the receiver chances to shine at both the top and bottom ends.

Prominent at the top was the salterio, a dulcimer-like instrument that can be hammered or plucked (in this case, hammered). The spidery runs of glittering tone color were startling and offered a counterpoint to the bright sunbeams of period violin and viola da gamba. When the percussion entered with a drum unspecified in the credits, the un-room-corrected bass was predictably full, but the firm control of its decay was also thrilling. The Duchess of Cambridge wouldn't let me read a book while playing this music (which was my original intention). I had to put down the book and listen, spellbound. One quibble: The receiver is supposed to



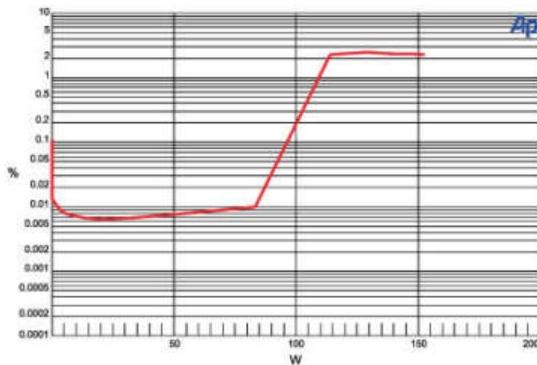
CXR120



● Seven of the CXR120's eight front-panel buttons are cleverly concealed in the corners of the center display.

Test Bench

Cambridge Audio CXR120 A/V Receiver



AUDIO This graph shows the CXR120's left channel, from A1 input to speaker output with two channels driving 8-ohm loads. Measurements for THD+noise, crosstalk, signal-to-noise ratio, and analog/digital frequency response were all within expected performance parameters. Full details available at soundandvision.com.—MJP

	0.1% THD	1.0% THD
2 Channels Continuously Driven, 8-ohm Loads	96.3 watts	109.3 watts
2 Channels Continuously Driven, 4-ohm Loads	121.3 watts	143.8 watts.
5 Channels Continuously Driven, 8-ohm Loads	771 watts	873 watts
7 Channels Continuously Driven, 8-ohm Loads	676 watts	81.1 watts

VIDEO The Cambridge offers a Processed / Pass Through option for HDMI in its onscreen menus, but this only applies to upconverting a 1080p source to 4K. The receiver does not upconvert lower resolutions. Therefore, the upconversion aspects of our tests (which currently apply only to resolutions up to 1080p) are not applicable. The receiver cleanly passed all of our other video tests.—TJN

SPECS

Power Output: 7 x 60 watts (8 ohms, 7 channels driven); 7 x 100 watts (8 ohms, 2 channels driven) • **Auto Setup/Rom**
EQ: Proprietary/none • **Video Processing:** 4K passthrough, upscaling • **Dimensions (WxHxD, Inches):** 16.9 x 6.5 x 16.5 • **Weight (Pounds):** 29 • **Video Inputs:** HDMI 2.0 (6), HDMI-MHL (1) • **Audio Inputs:** Coaxial digital (2), coaxial optical (2), stereo analog RCA (3), stereo analog minijack (1), 7.1-channel in (1) • **Additional:** Ethernet (1), USB (1), AM (1), FM (1), IR emitter in (1), IR receiver in (1), RS-232C (1) • **Accessory:** Bluetooth adapter port (1), Wi-Fi antenna port (1) • **Video Outputs:** HDMI 2.0 (2) • **Audio Outputs:** Stereo analog (1), sub (2), 1/4-inch headphone (1) • **Additional:** IR out (2), trigger out (2)

recognize DSD via HDMI but did not. I'm told a future software update will fix the problem.

One of my seven vinyl copies of *The Beatles* (yes, "The White Album," and yes, I am obsessed) is a 1976 Japanese pressing that I prize for shining a light into the murky mixes of some songs. The tradeoff is that the shrieking jet noise of "Back in the U.S.S.R." can be a tough way to get started. No, the Cambridge wouldn't soft-pedal the aggressive effect—but once I got beyond it, the receiver's clear-as-glass midrange delivered crystalline perfection with hypnotic songs like John Lennon's "Dear Prudence" and "Julia" and George Harrison's hushed "Long, Long, Long." While it's hard to find a pressing (or a receiver) that doesn't flatter the beautifully balanced string and horn charts of Paul McCartney's "Martha My Dear," the Cambridge gave them extra-well-defined shape and texture. The magic vinyl and receiver delivered all four of the band's voices (five, if you count Yoko's) with every morsel of their glorious timbre.

The untitled CD of trumpeter Clifford Brown and drummer Max Roach is in 1954-vintage mono and therefore a good test for center imaging when played in stereo mode. The Duchess aced it, vividly defining the trumpet and Harold

- The CXR120's remote is as slick and monochrome as the receiver itself.

Land's tenor sax without the crutch of room correction, with the piano, bass, and drums recessed behind them. She added something to this schematic but decent recording that's hard to define. It wasn't sweetness or warmth—just a high level of resolution that was easy on the ears. This familiar CD never sounded better.

Installing the Cambridge Connect app onto an iPad mini, I was able to access music from a network-connected PC as well as the iPad itself. The app is simple, quietly elegant, and easy to learn, though in some respects, it's not as slick as a receiver with integrated AirPlay. The

app adjusted volume only with its own control, not the tablet's volume keys. And it wouldn't operate in the background when I used a browser. So I finally spent some time with that book I'd put down a few evenings before, while Bill Evans' *Live at the Village Vanguard* (ripped in Apple Lossless) played in the background.

Cambridge Audio's CXR120 is an audiophile receiver par excellence, with all the nuance and finesse a music lover might crave. It's not the right receiver for someone who wants Atmos, room correction, or integrated Bluetooth or AirPlay, all of which are available at much lower prices. But it's a great choice if you're into vinyl, high-resolution audio, and the streaming of hi-res formats.

The Duchess of Cambridge is a great lady indeed. ♦

Audio Editor Mark

Fleischmann is the author of Practical Home Theater: A Guide to Video and Audio Systems, now available in both print and Kindle editions.



- The Cambridge has built-in Wi-Fi, but not Bluetooth or AirPlay.



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Bella Italia

By Daniel Kumin

Sonus Faber Chameleon T Speaker System

PRICE \$3,447 as reviewed

ITALIAN TECHNOLOGY DOESN'T get a lot of respect. (There's a version of the old joke where in heaven the police are British, the cooks French, and the engineers German; in hell the police are German, the cooks British, and the engineers—you guessed it—Italian.) But think only of Ferrari. Or Lamborghini. Better still, think of supercar maker Pagani, for which today's examinee, Sonus Faber, provides premium audio systems.

So I'll refrain from further perpetuating stereotypes or repeating tired Fiat jokes (to which I'd be fully entitled, having nursed one long-ago girlfriend's reviled 128 rust-bucket through a bitter Boston winter, at the cost of many a frostbitten finger). Instead, let me point out that Sonus Faber—Latin for "sound-smith"—has more than a 30-year history of producing serious loudspeakers competitive with the best from Britain, Canada, and the U.S., with a look and a feel that are distinctly Italian. Take the company's new Chameleon lineup. The Chameleon T tower, Chameleon B bookshelf/standmount, and Chameleon C center channel share an understated trapezoidal design that looks both formally pleasing and technologically no-nonsense. And as with nearly all other Sonus Fabers, the Chameleons' exteriors are lushly leather-wrapped, for a wholly unique look—and feel.

As their name suggests, however, the Chameleons' marquee feature is their interchangeable side panels, available in six colors (black, white, red, orange, gray, and blue) for each

model—the idea being, of course, that as décors change or the whim bites, owners can keep the loudspeakers' look fresh. Such an



● The Chameleons earn their name from their interchangeable colored side panels.

RATING

Sonus Faber Chameleon T Speaker System

Performance Build Quality Value

AT A GLANCE

+ Plus

- Very honest, very capable reproduction
- Unusual, and unusually attractive, cosmetics
- Excellent center-channel off-axis consistency

- Minus

- Ever so slightly warm balance may not please more analytical listeners
- Center is a trifle light on midbass body

attractive notion has been tried before, several times. I can specifically remember two such ranges, both perfectly respectable performance-wise, neither of which (if memory serves) reappeared in its respective maker's catalog the following season.

Absent the fashion-forward side panels, Sonus Faber's latest models follow conventional loudspeaker design. All three Chameleons employ vented enclosures, but in the case of the center-channel C, interestingly, the port is embodied by a passive radiator that takes the place of one of the horizontal speaker's seemingly dual woofers. On the underside of the B's plinth are routed three sides of a rectangular port, requiring the surface the speaker is placed on to provide the critical fourth side (lest the speaker suffer potential ill effects in the bass response).

La Disposizione

I arrayed the speakers as usual in my system: towers flanking my 52-inch LCD screen, center on a low stand below the screen's bottom edge, and surrounds on high shelves on either side of the listening position. I performed the

bulk of my listening, both stereo and multichannel, using a no-sub setup, with the towers running full-range. For checks of subwoofer readiness, my everyday SVS SB-12+ had the advantage of being a thoroughly well-placed, known quantity, already fully integrated into my room. For those interested, Sonus Faber's U.S. importer Sumiko markets three subwoofer models dubbed Sumiko by Sonus Faber whose design and features look similar to those of REL subwoofers I've tested in the past.

Setting up the Chameleons means first snapping on your selected side panels. These affix via plastic snap-pins, much like a conventional grille, leaving visible accent stripes of the aluminum substructure. (The speakers' actual cloth grilles use auto-aligning magnetic tabs.) As already noted, the Chameleons' cabinets are otherwise wrapped overall in black leather. The company's marketing materials say

"leather," not "pleather," so I



THE VERDICT

Wide-range towers and solid tonal matching make for a system that will fulfill many.

SPEAKER SYSTEM

SONUS FABER CHAMELEON T SPEAKER SYSTEM

PRICE: \$3,447 (**Chameleon T**, \$1,999 pr; **Chameleon C**, \$549; **Chameleon B**, \$899 pr)
Sonus Faber • sonusfaber.com

assume it's the real thing; at any rate, I'm not sure I could tell the difference. All in all, it's both a very elegant and a very unusual look. Cosmetic considerations completed, I hooked up the Chameleons—all three models furnish nice metal multi-way jacks, biwirable on the T and the B—and left them for a week's worth of break-in by way of casual use.

L'Audizione

Settling down for serious listening to the towers in full-range two-channel mode, I encountered a big, very slightly warm, and comfortable sonic signature. As with most other full-range towers in my studio, I had to pull them well out into the room (about 5 feet from baffle to wall) to mitigate midbass heaviness, but the Ts' natural back-tilt placed the ideal listening axis just about perfectly at seated ear height from 8 or 9 feet away. With the towers thus situated, tonal balance was very fine. Male announcers and baritone singers had just a touch of added fullness, as did the lower-middle bass span; the effect was overwhelmingly pleasant, and I never heard anything I'd characterize as boomy, bloated, or heavy.

Even tightly imaged material such as the Tokyo String Quartet playing Ravel (an RCA CD) produced an engagingly big stereo image. String tone was rewardingly natural but at the same time struck me as just on the warmer/richer side of the ledger (across from brighter/leaner). Nonetheless, transients like the *pizzicato* opening of the Ravel quartet's second movement had convincing bite, while being a shade less projecting than on my everyday (and long discontinued) Energy Veritas speakers—more of a “plint” than a “plink.” And I heard just a touch less growl where the Tokyos really dig into their

strings on the opening bars of the finale. But the upper octaves of string harmonics found throughout the Ravel retained their gorgeous sheen, and the Italian towers themselves disappeared into the music with satisfying effect. Soundstaging was generous, with considerable depth, and somewhat less hard-focused than on many small monitors.

Keith Richards' 1992 solo effort, *Main Offender*, is that *rara avis*, a mainstream pop recording with the sonics and dynamics of an audiophile disc. Its grit-free bite on guitars, in-the-room conviction of vocals, and—especially—you-are-there power and impact on drums (played by studio stalwart Steve Jordan) are truly exceptional. (Why can't every studio record sound like this, instead of the homogenized mush we so often get? It makes me mad!) And the Chameleon Ts did Keef full justice, even at the considerable levels I imagine the skull-wearing one would approve of. A kick drum, a snare (with the snares off), a Keith riff or two—what more does any reasonable soul require?

A track like the reggae-esque “Words of Wonder” demonstrates the recording best. It's unexpectedly clean and impressively dynamic, though still with some overdriven hair and nasally EQ on many of the vocals (possibly a legacy of a singer/producer who even after so many years remains ambivalent about his own voice). The Chameleon Ts' repro seemed just about ideal: lots of squeaky-clean impact even at

chest-thumping levels, without so much as a hint of squished or edge-smoothed tonality that might herald dynamic compression. Nice! The Ts produced more level than I'd ever desire from my 150-watt-per-channel amplifier, and a trial with a midrange receiver sounded just about as good, suggesting a manageable amplifier load.

Sonus Faber's towers had full output to 40 hertz or so, and very little emphasis in the critical octave above that point, which made for tight, lifelike sounds from well-recorded jazz and rock bass. The Ts seemed



● The Chameleon B sports a trapezoidal shape.

perfectly capable for most music, and I had no trouble integrating my sub to supply the bottommost octave, crossing over the SVS behemoth at 60 Hz. The difference in terms of in-room cohesion was minuscule, but long-term with these towers I'd probably still save a preamp or AVR preset set up for full-range two-channel mode for listening to most stereo music.

The Chameleon C center proved a very good match to the Ts, with one reservation. On most female announcers and higher-register male voices, direct comparisons of mono (Chameleon C alone) against stereo (the pair of Ts) were very close—in some cases, almost indistinguishable. But on lower male voices (typical of most news readers and voiceover artists), the C showed a distinct loss of bass fullness in the lowest vocal octave; a difference that was quite obvious. I found that crossing over the center channel to the Ts at 60 Hz, rather than either higher or not at all (that is, running the C full-range), improved matters substantially, but the difference was still clearly there.

However, that's only in the worst-case comparison of “naked” male announcers. While doing normal listening in the usual multichannel modes, I never noticed any shortcomings on voices or music,



● The Chameleons' front and top panels are leather wrapped.





- The Ts have a natural back tilt that projects the image upward.

and the Chameleon C demonstrated very fine off-axis balance. I heard next to no hollowness or "honk" at up to 45 degrees to the left, and just a mild amount of the former to the right (and then only at pretty extreme angles). The difference arises from the center's left-hand woofer being the sole active bass driver; the right is the passive radiator, so the C's mid-frequency



- The center uses one active driver and one passive radiator.

The Chameleons are excellent reproducers.

dispersion is slightly asymmetrical. Consequently, the speaker's acoustical origin is at the left woofer; to put the center channel truly in the center, you need to offset it visually a foot or so to the right, which is bound to upset someone's aesthetic sense. That said, if you sit more than 8 or 9 feet away, it's unlikely to make much odds either way.

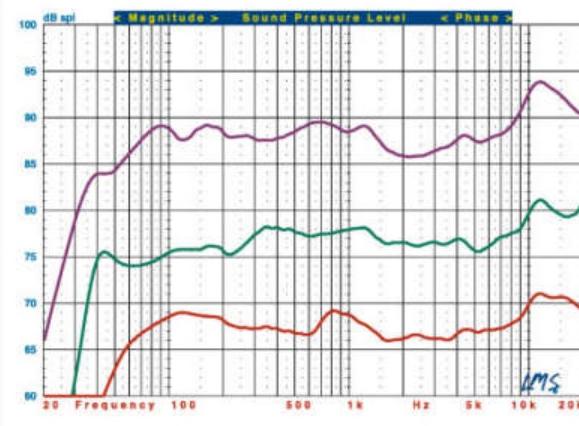
The Chameleon Bs assigned to my surround positions made a near-perfect timbral match to the towers. (I checked them in a side-by-side A/B comparison.) And these are very capable little speakers themselves, perfectly ready to deliver high levels and to absorb 100 watts or more of clean power. (In fact, for a subwoofer-assisted setup, I might just prefer a quad of Bs, placing the sub for best low-end integration.) In their surround duty, the bookshelf Chameleons performed admirably. The 5.1 layout delivered finely integrated sound on a wide range of film and TV programming even on so stern a test as the latest special edition of *Gravity*. This was an interesting demo, since the radio voices of Sandra Bullock and George Clooney occasionally move off screen, to channels other than the center. Tonal consistency remained very good, although I did notice the timbre shift when, early in chapter 2, Bullock's voice moves hard to the left front channel, where it gained fullness. Even without subwoofer support, the Sonus Faber layout had enough low-end grunt for satisfying movie playback. That said, those listeners who demand a genuine big-cinema wow-factor will want a true sub with some real 20-to-40-Hz authority.



See soundandvisionmag.com
for full lab results and technical definitions

Test Bench

Sonus Faber Chameleon T Speaker System



CHAMELEON T (purple) +4.44/-2.23 dB, 200 Hz to 10 kHz; -3 dB @ 53 Hz, -6 dB @ 34 Hz; impedance minimum 3.98 ohms @ 99 Hz, phase angle -31.22° @ 30 Hz; sensitivity 88 dB, 500 Hz to 2 kHz.

CHAMELEON C (green) +2.03/-2.26 dB, 200 Hz to 10 kHz; -3 dB @ 52 Hz, -6 dB @ 39 Hz; impedance minimum 5.20 ohms @ 186 Hz, phase angle -45.38° @ 96 Hz; sensitivity 86.5 dB, 500 Hz to 2 kHz.

CHAMELEON B (red) +2.27/-1.52 dB, 200 Hz to 10 kHz; -3 dB @ 54 Hz, -6 dB @ 47 Hz; impedance minimum 5.21 ohms @ 221 Hz, phase angle -37.11° @ 64 Hz; sensitivity 86.5 dB, 500 Hz to 2 kHz.—MJP

SPECS

Chameleon T: 7 in polypropylene cone woofer (2), 6 in polypropylene cone midrange, 1.1 in fabric-dome tweeter, 12 x 50.5 x 9 in (WxHxD), 54 lb • **Chameleon C:** 6 in polypropylene cone woofer, 6 in polypropylene cone passive radiator, 1.1 in fabric-dome tweeter, 21.5 x 8 x 8.5 in (WxHxD), 17.8 lb • **Chameleon B:** 6 in polypropylene cone woofer, 1.1 in fabric-dome tweeter, 7.3 x 12.4 x 11.1 in (WxHxD), 14.8 lb

La Linea di Fondo

There's no question that the Chameleon T, B, and C are excellent reproducers. Indeed, they are sonic standouts, solidly price-competitive in their crowded field—and for those turned on by their different-but-elegant looks, perhaps a bit more so. Question is, do you need a subwoofer? If you absolutely demand last-octave realism from the occasional asteroid or nuke (but how many real-world asteroid

strikes or nuclear detonations have you actually experienced?) or the full *Zarathustra* Monty, then yes, you need a sub, which could add as much as a grand or so to the system price. Even in that case, the Chameleons demand a listen, and a look. Anyway, who else can sell you orange towers? ♦



B

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Lights On

By Michael P. Hamilton

Elite Prime Vision DarkStar 9 Projection Screen

PRICE \$3,138 as reviewed

HIGH LIGHT-OUTPUT CAPABILITIES and receding prices in the DLP and LCD projector camps have recently broadened the application possibilities for two-piece projection video. One facet of design garnering prominent attention from screen manufacturers is ambient light rejection (ALR) technology, which allows a projector/screen combo to function as the big-screen TV in a multipurpose room the way a flat-panel TV might—though at a potentially much larger size.

A branch root of these innovative endeavors may be time-lined by the introduction of “gray” screens during the toddler days of LCD projection, as struggling black levels found welcome assistance from tinted screens. Arguments may ensue over whether “tint” is the appropriate connotation here—some insisting that, in the realm of projected light, gray is a *shade* within the overall balance of correct colorimetry and not an alteration. Well, then, imagine delivery day of your special-order Ferrari California in *Bianco Avus*, only to find that when unveiled, a *Grigio Ferro* exterior makes your acquaintance. Mamma mia! In the primordial days of screen benefaction, the general populace took kindly to the darker grays provided by these screen types. Sure, a few pesky devotees of the industry-standard D65 white point objected that some formulations were red-subtractive or made hockey ice appear dull, but we—er, I mean *they*—accepted forfeiting a portion of light output as ransom for higher contrast ratios.

Many refined forms of gray screens are satisfactorily deployed today in moderate ambient-light conditions. However, driven by fresh thinking and a Formula 1-style,

AT A GLANCE



Plus

- Exquisite color rendering
- Solid black level with a tremendous sense of image depth
- Glare-free viewing with sensible ambient light level



Minus

- Pricey compared with Elite's traditional screen materials, though in line with or cheaper than some other ALR solutions

no-holds-barred approach to the problem of projecting images in a lit-up room, some manufacturers have unearthed new materials and applications that produce astonishing results.

Historically, ALR screens have been used when light levels aren't easily harnessed or when partial illumination is desired, such as in dual-purpose areas with down-radiating light for reading. Increasingly, manufacturers are citing the enhanced contrast that ALR screens may provide compared with that of their white-reflective brethren, and they're urging that ALR screens be used in dedicated home theaters, where judicious management of light has always been a priority.

One company purveying a screen with these attributes is Elite Prime Vision, the custom-installation and systems-integration division of Elite Screens. Responding to our request for an ALR screen, EPV provided their DarkStar 9 model in a 110-inch-diagonal configuration (DS110H-ISF). Newly certified by the Imaging Science Foundation, DarkStar 9 is an active-filter, rigid and non retractable, optically based design, not an

RATING

Elite Prime Vision DarkStar 9 Projection Screen

Performance

Setup

Value

(More about that in a moment.) In comparison, the original DarkStar material was 1.4 gain with a horizontal angle of 70 degrees (35 degrees left/right) and a vertical angle of 32 degrees (16 degrees up/down). Its minimum throw ratio was 1.8x the image width.

Elite specifies a minimum throw ratio so that the vertical optical filter layer of a DarkStar screen, which is designed to absorb ambient light, doesn't also consume the desired projected light. With an excessively close throw distance and DarkStar material, a projector's angle of incident light becomes too steep for correct reflection; instead, that light will be diverted away from the viewer and result in a dimmer image (i.e., the optical filter layer believes it to be ambient light). Also possible is hotspotting, that proverbial “mariner's halo” at the center of the image, often seen on elderly screens in sports bars.

My DarkStar 9 review sample had a screen frame 3.9 inches wide.

(Keep in mind that this is an

extruded colored vinyl or vinyl/appliqué hybrid. Will the technologies employed prevent color shift, maintain unity gain, and reject penalizing ambient light? And when the screen is used in a controlled-lighting situation, will it enhance the viewing experience as claimed? Let's see whether our Ferrari will be white or gray.

Materially Speaking

The appropriately named DarkStar 9 offers a 0.9 gain when viewed head-on and offers a generous horizontal viewing angle of 180 degrees (90 degrees left/right) and a vertical angle of 36 degrees (18 degrees up/down). Minimum throw ratio for DarkStar 9 is 1.5x the image width, not the total screen assembly.



● Our review sample measures 110 inches diagonal.

THE VERDICT

No misgivings apply to this multi-layer, firm-surfaced material. Every atom of detail in the source reflects back with seemingly free, bonus lumens. If there's color shift at extreme angles, it's only measureable, not noticeable.

additional dimension for all four sides, appended to the 95.2 x 53.5-inch viewing surface.) While a 2.4-inch Special Edition frame was listed on EPV's Website at review time, the company says it's being discontinued, with development underway on a new super-sleek design.

The 0.3mm retro-reflective DarkStar material, as described in a video on EPV's site, "uses a complex, six-layer microfilter design that maximizes brightness by blocking 90 percent of ambient light." I asked an EPV spokesperson how many layers comprise the screen, earning a reply that they could only "quote 'multiple layers,'" so I defer to the video and presume it to be correct. The combination of the recessed reflective layer, below triangle-shaped microscopic filters providing off-axis vertical light rejection, enables the desired projected light to be returned to the viewer. Of the multiple DarkStar layers, one is said to be a tinted diffusion layer to enhance black levels for higher contrast ratios.

DarkStar 9 is stated to have a 6x increase in contrast ratio over that of standard matte-white screens.

EPV confirmed that the DarkStar material doesn't offer light rejection horizontally. However, in my time with the DarkStar 9, I found it adequately doing so, perhaps by default.

The reduction of gain from the original DarkStar's 1.4 to DarkStar 9's 0.9 creates the wider 180-degree viewing cone with improved uniformity to minimize color shift, granularity, hotspotting, and a darkened viewing-surface perimeter. DarkStar 9 is compatible with HD, Ultra HD, and 4K, meeting SMPTE .004 standards for dark-room environments.

Setup

The DarkStar 9 frame is one of the most substantial consumer screen frames I've seen. It's a bit of an erector set, in that the top and bottom frame members are each composed of two joined pieces and not shipped as a singular span. But the screen assembled methodically,

ELITE PRIME VISION DARKSTAR 9 PROJECTION SCREEN

PRICE: \$3,138 as reviewed

Elite Prime Vision • (562) 483-8198 • epvscreens.com

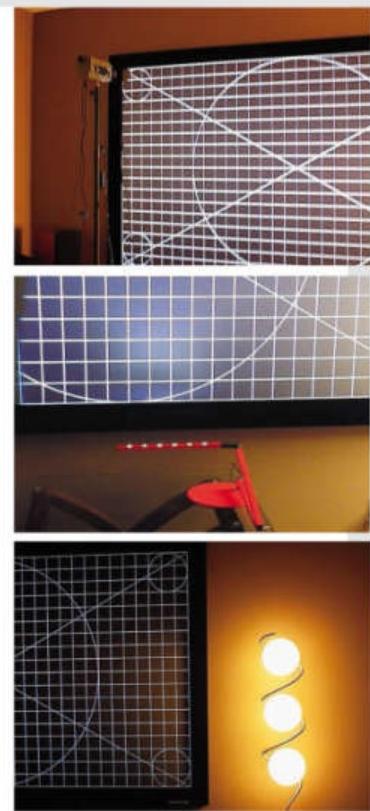
free of concerns. The viewing surface affixes handily to the rear of the frame via an army of spring clips. Yet from the moment of completion to the time the screen was repacked, I saw no signs of tension forfeiture.

I was able to retain the Epson PowerLite Home Cinema 3500 LCD projector I reviewed for our May issue (also available at soundandvision.com), believing it to be an ideal workhorse for an ALR screen pairing. With that projector, the only relative shortcoming I discovered was an inability to deliver cinema-level black (which Epson, following their usual philosophy, instead traded for light output at the \$1,600 price). That wasn't a significant factor for testing in an elevated-ambient-light environment. Using Epson's excellent suite of onboard color management tools, I dialed the duo in and shortly had it ready for evaluation.

For my review, the DarkStar 9 was wall-mounted in a completely light-controlled theater environment, with a door allowing daylight to sift in when necessary for testing. Additionally, I positioned various types of lighting above, under, and next to the screen to analyze its rejection capabilities. A floorstanding, incandescent lamp with three 60-watt globes was placed 24 inches from the right edge of the viewing surface and 12 inches perpendicular to the screen wall. Light emission from the three globes cast evenly across most of the right third of the screen. I rigged a tubular fluorescent trouble light from the ceiling, 12 inches from the wall junction at screen center, to cast light downward. Below, an LED fixture with a pretense to "daylight" color temperature was able to illuminate up from the screen bottom, testing the optical vertical filters in that domain. Although far from a scientific enterprise, these three types of ambient light plus a sunlight path from the outside sufficiently tasked the DarkStar material. Into my Oppo BDP-103 universal disc player went Rush's *Snakes & Arrows Live*, a tour de force 1.78:1 Blu-ray that I maintain is easily reference quality.

One by one, each type of light lashed out at the DarkStar 9, and only the incandescent fixture (the floorstander by the screen's right

PROJECTION SCREEN



● Top: Michael measured multiple points on the screen (from 12 feet, not as shown here). Below: Ambient light was sourced by an LED desk lamp and a floorstander, among others.

edge) dimmed the image to any degree. That happened when the image depicted the stage lighting being lowered between songs. But whenever the stage was seemingly afire from lasers, spotlights, and (occasionally) real fire, the DarkStar 9 punched out the image with the same authority that Alex Lifeson's Hughes & Kettner amps dealt his guitar riffs. From above and below the screen, each lamp had no identifiable effect I could spot from an appropriate viewing distance. When I moved closer into the incident angle of reflection, washout occurred, reinforcing EPV's caution regarding throw distance.

I'm no Carl Sagan, but I confirmed to my own satisfaction that the DarkStar 9 material delivers as promised on vertical ambient light rejection and is pleasantly effective in the horizontal plane, handling mildly unavoidable light leakage.

● The screen's fame adds another 3.9 inches on each side.



Test Bench

Elite Prime Vision DarkStar 9 Projection Screen



Elite Prime DarkStar 9, Luminance & Color Temperature, 100 IRE Full Raster

Screen Target Point	Meter Position (degrees off axis from Target)	Luminance (ft-L)	Color Temp (K)
Center	0	21.67	6511
Center	+/-15 (left/right)	21.42/21.39	6486/6489
Center	+/-30 (left/right)	20.66/20.94	6477/6471
Center Bottom	0	17.55	6550
Center Bottom	-15 (downward)	9.19	6448
Center Bottom	-30 (downward)	N/A	N/A
Top Left	0	13.1	6539
Top Left	-15 (left of target)	14.23	6550
Top Left	-30 (left of target)	13.98	6585
Bottom Right	0	14.28	6585
Bottom Right	+15 (right of target)	15.11	6554
Bottom Right	+30 (right of target)	14.69	6532
Center Side	0	18.94	6466
Center Side	+/-15 (left/right average)	20.62	6458
Center Side	+/-30 (left/right average)	19.64	6527

MEASUREMENTS were made while the room was light sealed. All measurements were taken at a distance of 12 feet from the screen surface. Instrumentation included a Minolta CS-200 color meter (NIST certified 12/2014) with a Quantum Data 780 generator and SpectraCal CalMAN 4 software.

THE projector was an Epson PowerLite Home Cinema 3500.

AFTER calibration of the projector to the screen, the grayscale Delta E measured on the DarkStar 9 averaged an excellent 1.96, mainly precipitated by an error of 5.22 at 20 IRE (20% brightness) that gave the overall average quite an uptick. Given the Epson's inability to go completely black, I didn't measure at 10 IRE and would not attribute this 20-IRE error to the screen. (Delta E is a figure of merit indicating how close the result comes to the D65 (6,500-K) color standard, with values under 3 to 4 generally considered undetectable to the eye.)

SCREEN luminance and color temperature were measured at the screen center and several target points across the screen, as shown in the chart. For each screen target, the meter was placed 12 feet away and directly head-on and perpendicular to the target point, then moved off axis in the direction indicated by first 15°, then 30°.

LUMINANCE with a 100-IRE Full Raster pattern measured at screen center from straight on registered at 21.67 foot-lamberts and 6,511-K color temperature.

WHILE the Minolta CS-200 is a capable field instrument for the purposes of video calibration, the chart readings are strictly for comparisons. They indicate exceptional uniformity for the DarkStar 9, with virtually no falloff in luminance across the midsection of the screen and modest light falloff in the corners, which may be related to lens capabilities in the projector and not necessarily due to screen performance. Color temperature remained essentially stable at any point across the screen.

THE readings from Center position suggest that viewers sitting up to 30° off axis from the sweet spot should see no drop in brightness or shift in color. The Bottom Center reading could only be taken from head on and from a 15° downward angle due to the steepness of the 30° angle from that target point. The dropoff of light down to less than 10 ft-L from -15° downward indicates the screen's optical filtering in play. Sitting on the floor would not be optimal for viewing such a screen.—MPH

DarkStar-Gazing

I now turned to what only a few years back would have appeared to be logically incongruent: using an ambient light-rejecting screen in an

environment devoid of ambient light. (Sorry, Mr. Spock!)

With the lights turned off for traditional dark-room theater viewing, I placed into the Oppo's tray the 2004

SPECS

Viewing Surface (WxH, Inches): 95.2 x 53.5 (110-in diagonal) • **With Frame (WxHxD, Inches):** 103.1 x 61.4 x 1.7 • **Aspect Ratio:** 1.78:1 • **Gain:** 0.9 • **Retractable:** No

film adaptation of the musical *The Phantom of the Opera*. In chapter 3 at 9:33, Monsieur Lefèvre proceeds with turning over the Opéra Populaire to Mssrs. Firmin and André. Underneath the layer of his overcoat, Lefèvre's suit jacket is visible. In my viewing notes, I wrote, "I've seen this passage hundreds of times; never noticed the raised velvet pattern on the suit. The texture is stunning with black gradients." A few minutes passed before I was interrupted by friends, curious about what I was doing. I invited them in, while cueing up another point of reference. Hearing it was *Phantom*, they gave up a collective "ugggh" (these friends being of the rock-'em-sock-'em ilk). Pressing play for chapter 14 at 55:05, I summoned the scene where Carlotta (Minnie Driver) is in a pink mink wrap and a lace-strewn hat that's appropriately flowered and sporting a feather. The "ugggh" pivoted to "Holy jumpin'! That's amazing! I can't believe how spectacular that looks! How much is this?" Not exactly the type of seminal moment that ends world conflicts, though it might be in the zip code of "build it, and they will come."

What it reinforced for me is that a little powerhouse projector like the Epson PowerLite Home Cinema 3500, when coupled with a high-technology screen, can dance around the price ranges occupied today by 75- to 80-inch flat panels. While those are UHD 4K (and in this instance, the Epson is 1080p), the glare-free, large impact of a partnership like this is mighty compelling; indeed, there are much worse ways to await the 4K rollout. As *Phantom* continued and Christine got set to replace Carlotta on stage, I changed viewing angles at various radii around the screen. My notes point out "no apparent loss of luminance, nothing amiss color-wise; black level solid anywhere the screen is viewable."

I followed with Pixar's *Cars*, the beginning a splendid way to test black level. As the soundtrack keeps us aurally captive on the infield at a "hot" racetrack, the image remains black. During that span, the Epson 3500 revealed its performance frailty of weak black level—no fault of the screen. Moments later, a lightning burst of color places you behind a

cartoon windshield, catapulting down asphalt. Once more, it goes black; Lightning McQueen's voice searches deep inside for the confidence needed to conquer the checkered flag. What the DarkStar 9's contrast increase does exceptionally well is pull the active image dimensionally forward in such a way that black bars retreat nicely to the background, though without fully disappearing on a projector with limited contrast like this Epson. On a projector with deeper native blacks and higher contrast, it probably wouldn't be necessary to mention black bars, as they likely would be absent on most scenes.

Another intriguing benefit of the DarkStar 9 in dark-room viewing is that its design, which focuses the projector's light directly back at the viewer, minimizes the typical effect of reflected screen light energizing the side walls. This further enhances contrast.

To the 9s

The Elite Prime Vision DarkStar 9 has a split personality, and both of its personas are equally appealing. With judicious placement that avoids having ambient light fall *directly* on the screen, it offers the option of enjoying a dramatically larger glare-free image than that of many flat panels at or near the combined ticket of a DarkStar 9 plus a budget-priced (under \$2,000) high-light-output projector. While this screen tallies a bit north of \$3,000 all by itself, the technology involved and the results it coaxes from the source definitely command comparison with other screens making similar claims. I feel confident calling the DarkStar 9 a top contender in overall ALR performance.

Where the DarkStar 9 will have you completely rethinking your approach to screens, however, is in its use for light-controlled theater environments. Any projector will benefit from the ultra-wide viewing angle, which at the same time retains uniformity. Add in enhanced contrast with ocean-deep black levels, flat spectral response, and accurate color fidelity, and you've got an ALR screen that can clearly serve double duty when the lights go down. The DarkStar 9 earns my enthusiastic recommendation.♦



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Taking on New Heights

By Darryl Wilkinson

Origin Acoustics Director D108 In-Ceiling Speaker

PRICE \$1,600 each,
\$14,400 as reviewed

LOVE HIM, HATE HIM, OR SIMPLY wonder what's up with all the tattoos, there's no denying the fact that Jeremy Burkhardt is one of those distinct personalities who has had a profound effect on the custom audio/video industry. Then again, he may be someone you've never heard of, unless you're in the custom installation business. Unlike other notables—such as Polk, Carver, and Bose—Burkhardt isn't the name of a speaker brand. Nevertheless, if you've listened to a set of in-wall or in-ceiling speakers, especially one of the bazillion or more models SpeakerCraft has produced over the past 25 years (including tons built for other brands), you've felt—or, rather, heard—Burkhardt's influence on architectural audio.

As they say, however, what have you done for me lately, Mr. Burkhardt? The answer: Origin Acoustics. Bored with retirement, Burkhardt (along with two fellow originators of SpeakerCraft, Ken Humphreys and Ed Haase—thus the "Origin" in the new company's name) decided to "invent and create the world's best-sounding loudspeakers." Of course, no one starts out with the idea of making "the world's third or fourth best" or "fair-to-middling" speakers. But these guys claim an impressive 100-plus years of design and engineering experience among them, so they have about as good a shot as anybody at hitting the target.

If You've Got a Hole...

You could say that the dictum at Origin Acoustics is, "If you've got a hole, we've got a speaker to fill it." (Or...maybe not.) In any case, the two-year-old company already offers 40 different models, with more to be released soon. The current lineup includes traditional in-wall and in-ceiling configurations, thin-fit designs, all-weather cabinet models, "landscape" speakers, and in-ground outdoor subwoofers. There's a trio of in-room subs, and Burkhardt told me there'll be an appropriate assortment of architectural subs in just a couple of months.

The Director D108 is Origin's top-of-the-line in-ceiling speaker, and the company shipped several of them for this review. However, true to Burkhardt's philosophy of "go big, or go bigger," he didn't send a typical five-channel system (such as a trio of D108s plus a couple of smaller in-ceiling speakers for the surrounds). Instead, UPS brought nine D108s—along with the polite suggestion from Burkhardt that I try out an all-in-ceiling Dolby Atmos 5.0.4 system. (More on that "0" later.)

At this point, depending on your familiarity with Atmos, you're either bemused or totally confused. I'll skip over the technical stuff and begin by saying that Atmos for your home theater is a setup that can reproduce movie sound in three dimensions: side to side, front to back, and floor to ceiling. Atmos playback, in its recommended configuration, requires four height-channel speakers (two if you're a cheapskate)

in addition to the five or more speakers in a normal surround system. For ideal situations, Dolby recommends using in-ceiling speakers for the height channels and in-room speakers for the rest. An alternative is the use of Atmos-enabled in-room speakers that reflect sound for the height channels off the ceiling.

Conspicuously absent is a recommended configuration with all in-ceiling speakers (with or without a sub). It may seem logical to avoid that setup, since it's difficult to create a separate sense of height when all the speakers are aligned in the same plane (i.e., the ceiling). But that doesn't necessarily mean an all-in-ceiling configuration won't work. In fact, Burkhardt isn't the first speaker peddler with whom I've discussed the idea. And according to Burkhardt, a few Origin Acoustics dealers have been selling and installing in-ceiling Atmos systems and getting great results.

So, despite the prospect of me laboriously cutting nine large holes in my theater room's ceiling, S&V editor Rob Sabin gave me the architectural-Atmos go-ahead, with the caveat that any structural damage, bodily injury, or grief (from Dolby or my family) was totally my responsibility. Empathy is not his strong point. [Ed. Note: At this point, Darryl has cut so many holes in his listening room ceiling and walls that his house is in danger of falling down. We can't let him review anything else without signing a release form.—RS]

Depth and Axes

One of the D108's bigger (or smaller, depending on

RATING

Origin Acoustics Director D108

In-Ceiling Speaker

Performance

Build Quality

Value

AT A GLANCE

+ Plus

- Tool-free twist-lock mounting
- 10-inch woofer fits an 8-inch cutout
- Aimable tweeter and midrange

- Minus

- Requires 7.5 inches of mounting depth
- Wants lots of power
- Raised soundstage

your outlook) selling points has to do with size. The woofer, for example, is 10 inches in diameter, which results in approximately 60 percent more surface area than what the more commonly used 8-inch woofer provides. In-ceiling speakers with 10-inch woofers are rare, primarily because that diameter and the associated weight usually require a big, gaping hole to be cut into the ceiling, with an even larger bracket to hold it in place and an impossible-to-hide, industrial-looking grille/flange to cover it. After all, in-ceiling speakers are supposed to disappear in the ceiling—not replace the ceiling.

As it is, the required cutout for most in-ceiling speakers with 8-inch woofers ranges from 9.4 to almost 11 inches in diameter, and the few speakers with 10-inch woofers need well over 12 inches. Surprisingly, the D108 requires only a 10%/-inch hole. Think about that. The hole the D108 fits into is only $\frac{1}{8}$ of an inch larger than the woofer itself. Increasing the size of the woofer comes at a



The D108 performs way more than acceptably without a subwoofer.

● The midrange and tweeter are mounted in a rotating structure.

THE VERDICT

No in-ceiling architectural speaker is perfect, but the D108 comes stunningly, spectacularly close.

cost, however, and that cost is added depth. Whereas in-ceiling speakers with 8-inch woofers rarely extend beyond 6 inches, the D108 is 7.5 inches deep, which means you'll need plenty of open cavity above the ceiling where the speakers are going to be mounted.

Another reason for the extra depth is the fact that the woofer is recessed approximately 3 inches behind the grille, making room for the hemispherical tweeter/midrange assembly that "floats" above the woofer on four side-support struts that allow it to pivot up to ± 18 degrees off axis. The 0.75-inch tweeter suspended above the 4-inch midrange pivots independently, too. Both the woofer and midrange cones are made using Kevlar as an ingredient. (I assume that means they're at least somewhat bulletproof, but I decided not to test that since I had enough holes in my ceiling already.) [Ed. Note: As I was saying...—RS]

Zippity-Clippity-Doo-Dah

Whether you're a homeowner hiring professional installers or a dyed-in-the-wool do-it-yourselfer, ease of installation is very important—especially when it comes to in-ceiling speakers—because it can help keep labor costs and/or DIY time to a minimum. Thankfully (since I used nine speakers), the only way

the D108 could be easier

to install is if it cut the hole itself. Of course, installation isn't totally tool-free, as you'll need some sort of device to cut the required 10½-inch hole in the ceiling. (In addition to the basic drywall knife, there's a variety of hole-cutters out there. Parts Express has an awesome adjustable one that cuts holes up to 11.75 inches in diameter and includes a clear dust shroud that makes the need for cleaning up almost nonexistent.)

Once the hole is cut, you insert the slightly flexible mounting bracket into it and squeeze the four ratcheting "ZipClips" to compress the ceiling tile or drywall between them and the outer flange of the mount. The end result is similar to using traditional dog-ear clamps—except that no screwdriver is required. After connecting the speaker wire to the D108's spring-loaded terminals, you slide the speaker into the bracket, line up one of the tiny triangles printed around the outer edge of the speaker with the "unlocked" symbol on the flange, and then turn the speaker about 1½ inches clockwise until it locks into place. Located opposite one another on the outer rim of the speaker chassis are three-position switches for bass and treble adjustments. The magnetic grille is so excited to be part of the system that it leaps from your hand to the front of the speaker.

While we're on the topic of installation, all of Origin Acoustics' Director Collection speakers, including

ORIGIN ACOUSTICS DIRECTOR D108 IN-CEILING SPEAKER

PRICE: \$1,600 each, \$14,400 as reviewed

Origin Acoustics • (844) 674-4461 • originacoustics.com

the D108, have a certified weather-proof rating of IPX6. Origin says the rating "ensures that these high-performance speakers are safe from the corrosion and internal damage posed by ocean water and rainstorms" as well as sprinkler systems and garden hoses. That means they can be installed in bathrooms and saunas, outside under eaves, and even on boats. Submarines are out, though, because the D108s are not rated for total immersion.

Ceilings Don't Have Ears

In-ceiling speakers don't get much respect, for good reason. Most of them sound awful, and worse, many are cheap pieces of crap made from little more than twisted animal balloons (used), toilet paper (new), and soda cans (empty but still a little sticky). The end result is something that barely deserves to be used for background music (so-called). Quality of parts and engineering notwithstanding, there's also the hard-to-overcome issue of the speaker being placed above your ears instead of in front of them.

When I began installing the D108s in the ceiling, it became obvious that Origin Acoustics is serious about making top-notch architectural speakers. These speakers look great and are well built, and the engineering is excellent. The "Tri-Linear" design (fixed woofer plus pivoting midrange with central pivoting tweeter) is Origin's attempt to compensate, as much as is physically possible, for the fact that the speakers are going to be mounted above the listener. Such significant engineering effort and attention to detail should be the case, of course, considering the fact that, with the D108, 1.6 K isn't a crossover point but the price of a single speaker. You might be surprised to know, by the way, that at \$1,600 each, the D108 isn't the most expensive in-ceiling speaker on the market. Regardless, for that kind of money, the D108 had better sound pretty damn amazing—no, significantly better than pretty damn amazing.

I've reviewed a lot of in-ceiling speakers over the years, and



● The D108's 10-inch woofer is recessed 3 inches behind the grille.

● Darryl's used the ZipClips to install the mounting ring, locked in the speaker, then aimed the midrange and tweeter.



TEST REPORT



● **The D108 is 7.5 inches deep, so you'll need space above your ceiling.**

(thankfully) while most of them were decent speakers for the money (especially when used for surrounds), very few of them were in the “pretty damn amazing” category. Considering the Burkhardt-buildup prior to this review, I was hoping I’d be able to add the D108 to that list, but I can’t. After listening to configurations including anywhere from two to nine D108s—without a subwoofer in the system, as suggested by Burkhardt—I can only say that the D108 goes beyond pretty damn amazing and belongs in a higher, empyreal realm of in-ceiling speakers that are truly awe-inspiring.

Yes, awe-inspiring—but with the in-ceiling caveat of “You can’t change the laws of physics!” The D108s are in no way capable of tricking your ears into totally believing the sound is coming from directly in front of you, as if there was an ethereal pair of tower speakers in the room. I haven’t yet discovered any in-ceiling speaker that can convincingly and consistently do that. But the D108’s wide dispersion and pivoting tweeter/midrange assembly do help bring the image down from the ceiling. In my theater room, I have a flat-panel TV mounted on the wall and a 110-inch screen that drops down in front of it when I use my projector. In both situations, the dialogue seemed to come from the screen, and the front soundstage was quite natural.

Tilt-a-World

When I listened to two-channel music with the screen turned off, the impression was a little different. Instruments, vocals, studio effects—indeed, all ingredients—were elevated, as if the performers were on an elevated stage and I was down below in the front row. Even considering how slow my brain is nowadays, it didn’t take long for me to become accustomed to that quirk in the playback and not pay much attention to it. That’s when the magic happened.

Once I accepted the inevitable—that is, the elevated soundstage—I gradually became aware of how

subtle the D108s are. The imaging (raised as it was) came over spectacularly, and the soundstage was impressively wide and deep. The tone of Sonny Rollins’ tenor horn on “Blue 7” (*Saxophone Colossus*) was so smooth and rich that I wanted to make love to it right then and there. (Fortunately, the D108s have strong grilles.) I’m truly at a loss for words to describe the pure emotion that came from the speakers while I listened to David Fray and Jacques Rouvier playing Fantasia in F Minor for Piano Four Hands, D. 940 (*Schubert: Fantaisie*). In addition to allowing the delightful nuances of the piano’s upper strings to come through, the D108s were astonishing in how cleanly and openly they reproduced the gradual decaying resonances within the piano. On Emmylou Harris’s “Boy from Tupelo” (*Red Dirt Girl*), the precise placement of vocals and instrumentation within an extremely wide soundstage was absolutely amazing.

A Bass-less Suggestion

Of course, the origin of this review was a conversation with Burkhardt about an all-in-ceiling Atmos system. While we were talking, he boasted that the bass performance from the D108s is so good—Origin specs them down to 25 hertz—that I should give the system a try without using a subwoofer (although he did send along a Basic Sub10 in-room sub, “just in case”). So I took the man at his word and did nearly all of my listening tests sans sub, for both the music described above and the movies discussed below. And when you think about it, if someone wants or needs all of his/her speakers in the ceiling, then adding a black box on the floor (or even a sub in a wall) isn’t always going to be a friendly solution.

Was the D108 system able to perform acceptably with a goose egg in the subwoofer slot (5.0.4), as claimed? To my surprise, it performed way more than acceptably. Having nine 10-inch woofers arrayed in the ceiling provided extremely smooth bass response throughout the room. It wasn’t the

SPECS

10 in Kevlar cone woofer, 4 in Kevlar cone midrange, 0.75 in silk Dual Plane Stabilized Diaphragm tweeter; 8 ohms nominal impedance, 11.25 x 7.5 in (Dia x D); 9 lb

dancers kicks a couple of beakers toward the screen, shattering them in midair. With that special effect, I did get the sensation that the shards were flying past me in almost the same manner as with other Atmos arrangements. In the same film, one of the lightning bolts should have zipped past my ear to the left, but sizzled just above my ear. The same can be said about the effects that occur during the final battle/destruction scene in *Jupiter Ascending*. Whereas parts and pieces from exploded structures and glass walls should have exited the room at ear level, the D108s weren’t able to drop their apparent positions down that low.

I do want to emphasize this point, though: An all-in-ceiling Atmos configuration—at least this D108 system—still has more height and engagement than a five- or seven-channel non-Atmos system. I can’t recommend it as a first choice because in-room/in-ceiling combos or Atmos-enabled speaker systems are still going to perform better in the extension of the height dimension. But if you want or have to use in-ceiling speakers, it’s definitely worth going with an all-out, all-in-ceiling Atmos arrangement.

Conclusion

There’s no point in trying to come up with some clever, cute, flowery conclusion to this review. The simple takeaway is this: In overall performance, the Origin Acoustics D108s are the best in-ceiling speakers I have ever heard. Although you could get a more realistic horizontal placement of the soundstage with a pair of in-room speakers up front, you’d have to buy a truly excellent pair of tower speakers to match the D108’s subtlety of mid- and high-frequency performance as well as its strong bass output. Generally, in-ceiling speakers aren’t my first choice for speakers in a room. But when in-room speakers aren’t an option, and you need anything from a single pair of in-ceiling speakers to an “are you crazy?” full-on Atmos system, the D108s are without reservation my top recommendation. •

The D108 goes into a realm of in-ceiling speakers that are awe-inspiring.

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David Vaughn,
Sound & Vision.com,
Feb/March 2015

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FEATURES ★★★★★
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Bob Ankstok,
Sound & Vision.com,
Dec 2014

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Entertainment

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BLU-RAY

The Gunman



Universal

Penn Is Mightier Than the Sword



After assassinating Congo's Minister of Mining in 2006, Jim Terrier (Sean Penn) must flee the country, leaving the woman he loves (Jasmine Trinca) to his friend Felix (Javier Bardem). Eight years later, Terrier returns, only to discover that he has become a target. Searching for answers as he struggles to stay alive, Terrier manages to either murder or precipitate the death of everyone he meets, including his closest friends. In the end, with the help of a clever Interpol agent (Idris Elba), Terrier learns that his former employer is trying to eradicate all evidence of the crime—including him. As the carnage subsides, he pays for his sins then reunites with Trinca: an ending that surprises no one. Although *The Gunman* features solid supporting performances from Ray Winstone, Mark Rylance, and especially Elba, Penn's portrayal crosses the line from restrained to just plain flat and—coupled with a predictable plot line, cliché dialogue, and uninspired direction—results in a film that evokes neither empathy nor excitement.

But while *The Gunman* disappoints from artistic and entertainment perspectives, its production values are extraordinary. Set



BLU-RAY
STUDIO: Universal, 2015
ASPECT RATIO: 2.40:1
AUDIO FORMAT: Dolby Atmos/
TrueHD 7.1
LENGTH: 116 mins.
MPAA RATING: R
DIRECTOR: Pierre Morel
STARING: Sean Penn, Idris Elba,
Javier Bardem

PICTURE ★★★★★
SOUND ★★★★★
EXTRAS ★★★★★

design is lavish and authentic, costumes are scrupulously realistic, and Marco Beltrami's soundtrack—one of the film's few highlights—is suspenseful and nuanced. Video quality is outstanding. Colors are naturally rich, with great breadth, canny balance, and minimal saturation. Fleshtones are unfailingly natural, changing with lighting and environment. Blues pop in many scenes, adding a welcome bit of interest. Black levels are deep and detailed, with superb rendition of shadows. Whites are equally dimensional, featuring a rich tonal palette that never becomes washed out, even during the brightest outdoor scenes. Textural details such as clothing, hair, and the plentiful shots of Penn's chiseled torso (remarkable for a 55-year-old) are meticulously resolved while more subtle visual

RATINGS	Poor	Fair	Good	Excellent	Reference
PICTURE	★	★★	★★★	★★★★	★★★★★
3D-NESS	★	★★	★★★	★★★★	★★★★★
SOUND	★	★★	★★★	★★★★	★★★★★
EXTRAS	★	★★	★★★	★★★★	★★★★★

cues—the vintage drilling equipment featured early in the film, for example—are rendered with microscopic precision.

Good as *The Gunman*'s image quality is, audio is even better. Gunshots and explosions, sonic staples of this film, are conveyed with extraordinary power and impact. A bit of bass boost adds a welcome dollop of definition to percussive effects and ensures your subwoofer will take you on a two-hour thrill ride. Dialogue is crisp and natural, with the specific inflections and tonalities of each actor's voice rendered distinct as DNA. Foley effects are plentiful and startlingly natural, possessing a palpable, reach-out-and-touch-it quality that heightens realism. Music scoring is beautifully balanced, notable for its wonderful tonal and instrumental detail. Most impressive, however, is the spacious and seamless re-creation of space. Chapter two includes a scene that finds Bardem and Trinca conversing in a hospital while a car passes from the left rear through the left front speaker, by which time the actors have moved outside. The rear-to-front transition is tangible—the stuff of goose bumps—just one of the sonic delights that make *The Gunman* a true showoff disc. Though not evaluated here, the supplied Dolby Atmos option should only improve the audio experience.

This Blu-ray package's total absence of extras is both surprising and disappointing: Were the cast and crew embarrassed? Owners of high-performance home theaters—and anyone else who appreciates cinematic craftsmanship—will find *The Gunman* decadent eye- and ear candy. Those who crave quality entertainment, however, will develop a case of indigestion.

• Anthony Chiarella

"The shooter, and the shooter only, is into the wind."

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HOME

ALL THE RIGHT BOOV'S

DreamWorks



The Boov are a race of cuddly aliens with a problem. While apparently doomed to roam the galaxy in search of a new home, they discover Earth. After first moving the entire human population into planned, micro-home communities in Australia, they settle in. No Boov is more enthusiastic about finding a home at last than Oh. But he's trouble-prone, and this time has accidentally e-mailed an invite to everyone in the galaxy, including the Gorg (the Boovs' archenemy), to his Warming of the House party.

Oh escapes from certain punishment, and while fleeing, he encounters a human youngster named Tip, overlooked (with her cat Pig) in the Down Under relocation. Together they set out to both find Tip's mother and hide Oh from the pursuing Boov.

Home will never be included in anyone's list of best animated features, but it has its charms. Most of its humor appears to be aimed at pre-teenie-boppers, but it offers enough chuckles (and warmth) to keep many older animation fans amused. And the vocal work is impressive, including Jim Parsons (from TV's *The Big Bang Theory*) as the voice of Oh. But it's Steve Martin in a smaller role as Captain Smek (the leader of the Boov) who very nearly steals the movie.

The computer animation is also first rate. Though less eye-popping than DreamWorks' best visual efforts (for me, this means *Kung Fu Panda* and *How to Train Your Dragon*), its subtleties stand on their own. The Blu-ray's 2D transfer is also beyond criticism.

The audio is competent, though it lacks the explosive dynamics and deep bass of the best Blu-ray soundtracks. And the score, with too many forgettable songs, occasionally works but more often is just annoying.

The 3D version isn't groundbreaking, but viewers enthusiastic about 3D will find it more than satisfying. I saw no ghosting, and since the film (with few exceptions) is brightly lit, the typically darker 3D picture shouldn't be an issue on most 3D sets.

The extras are extensive, mostly built around a "party" theme. They include outtakes and deleted scenes (mostly storyboarded or partially animated) and humorous background details on the Boov. The best extra, however, is "Almost Home." It tells of the Boovs' failed prior attempts at finding a home, and thanks to both the (full) animation and Steve Martin's Captain Smek, it provides the rib-tickling hilarity that's in short supply in the movie itself.

● Thomas J. Norton



BLU-RAY 3D

STUDIO: DreamWorks 2015
ASPECT RATIO: 1.78:1
AUDIO FORMAT: DTS-HD Master Audio 7.1
LENGTH: 94 mins.
MPAA RATING: PG
DIRECTOR: Tim Johnson
STARRING: Jim Parsons, Rihanna, Steve Martin, Jennifer Lopez

PICTURE

★★★★★

3D-NESS

★★★★★

SOUND

★★★★★

EXTRAS

★★★★★



EX MACHINA

Lionsgate

ARTIFICIAL INTELLIGENCE—
WHAT COULD GO WRONG?

Computer programmer Caleb Smith wins an inter-company competition to spend a week at the remote estate of the company's brilliant, yet quirky CEO and founder, Nathan Bateman. He soon learns that the vacation will be anything but when he's coerced into signing a non-disclosure release in order to administer a Turing Test on a new AI program that could revolutionize the world. It turns out that the AI has been placed in a fully functional—and human-looking—robot named Ava, who has been locked in a glass enclosure and can't be freed unless she proves to Smith and Bateman that she's achieved full consciousness and is not just copying human behavior.

Writer-director, Alex Garland, has written numerous A-list screenplays before, but this is the first time he has directed, and it's quite a debut. The film doesn't move at a brisk pace, but this only helps build tension and momentum towards the conclusion where you know something bad is going to happen to someone. The interplay between Domhnall Gleeson (Smith) and Oscar Isaac (Bateman) is outstanding as they play their game of cat and mouse—is Bateman being honest with Smith, or does he have ulterior motives? Why was Smith chosen for this project? Is it some type of setup?

Unlike most movies these days, the film doesn't look to have been color-graded in post-production, and the resulting image is very natural and lifelike. The digitally shot production teams with detail, especially on the exterior shots, and the CGI is completely seamless with the live action. Its only real flaws are that shadows are a bit too murky, darker scenes exhibit some digital noise, and it can be a tad soft on occasion.

Ex Machina has the distinction of being the first Blu-ray title to support DTS:X, DTS's answer to Dolby's Atmos object-based audio format. Unfortunately, there's no hardware that currently supports the format, so my evaluation is of the core DTS-HD Master Audio 7.1 track, which is outstanding. While the majority of the soundtrack is subdued, there are instances where it comes to life in order to shock the audience. Pans move succinctly throughout the soundstage, and although it's rarely called upon, the LFE is demo-worthy when it comes to life.

Supplements include two in-depth making-of featurettes, nine behind-the-scenes vignettes, and a UV Digital Copy.

This is one of the best sci-fi films in years. I can't wait to give it another spin when DTS:X arrives. ● David Vaughn



BLU-RAY

STUDIO: Lionsgate, 2014
ASPECT RATIO: 2.40:1
AUDIO FORMAT: DTS:X / DTS-HD Master Audio 7.1 core
LENGTH: 108 mins.
MPAA RATING: R
DIRECTOR: Alex Garland
STARRING: Domhnall Gleeson, Alicia Vikander, Oscar Isaac

PICTURE

★★★★★

SOUND

★★★★★

EXTRAS

★★★★★



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INSURGENT

CHANGE IS IN THE AIR

Lionsgate

► Picking up five days after the thrilling conclusion of *Divergent*, we find Tris and her companions in exile with the Amity group while they decide what their next move will be. Riddled with guilt over the death of her parents, Tris does her best to look strong, but she's carrying around some serious emotional baggage. When the authorities finally catch up to her in the second act, the back story of the isolated community starts to make more sense, and as shocking as it sounds, Tris is the gateway to the past as well as their hope for the future, despite the Erudite's leader doing her best to silence the rebellion.

Robert Schwentke takes over the director's chair for the second installment and does a commendable job with the weakest of the three-book saga. Without Shailene Woodley's ability to command a scene, I doubt the film would have been half as entertaining as it is with her in the lead, and she does a fantastic job of playing the reluctant hero.

Like the first film, the digitally shot production is quite impressive, with razor-sharp edges and great onscreen depth. The film is available in 3D as well (not reviewed here), and there are many scenes that probably shine in the seemingly dying format. Regardless, the 2D is no slouch, with plenty of detail in clothing and facial pores, and the CFI-intensive shots are extremely well done.

As much as I enjoyed Woodley's acting prowess, it's the Dolby Atmos (TrueHD 7.1 core) track that's the true star of the show. The use of pinpoint discrete effects that object-based audio provides really places you in the scene and gives you that "being there" feeling. The film opens with Janine, the ruthless leader of the government, broadcasting a message to the masses. As the camera moves through the scene, her voice moves from the center speaker to overtop and then left to right, depending on the camera's perspective. This is the first of many such occasions throughout the film that showcase what is arguably the best Atmos track on Blu-ray.

The robust supplement package contains an audio commentary from the producers, a fantastic behind-the-scenes documentary, five informative feautettes, and a marketing gallery, along with a UV Digital Copy of the film.

Of the recent teen book adaptations, this is probably my favorite due to the compelling story, excellent acting, and fantastic CGI-integration. Recommended.

● David Vaughn



BLU-RAY
STUDIO: Lionsgate, 2014
ASPECT RATIO: 2.40:1
AUDIO FORMAT: Dolby Atmos/
 TrueHD 7.1
LENGTH: 119 mins.
MPAA RATING: PG-13
DIRECTOR: Robert Schwentke
STARRING: Shailene Woodley, Theo
 James, Kate Winslet



RUN ALL NIGHT

SINS OF THE FATHER

Warner Bros.



Remember all those humorous aphorisms concerning Chuck Norris? You know, "Chuck Norris is so tough... yadda yadda yadda."

Well, if there's a worthy contender to seize that crown of ultimate machismo from him, it would have to be Liam Neeson. Seriously, look at the guy's rap sheet of action flicks in the last ten years, and you'll see a body count that would rival that of the Black Plague. Yes, the man who was Oskar Schindler could now take on the Expendables all at once at still come out grinning. And his string of gritty action thrillers continues with *Run All Night*.

Neeson plays Jimmy Conlon, a man with deep ties to the New York Irish mob that go way back to his youthful days as a mafia hit man. Well into his 50s now, he's a burned-out drunk trying to escape the sins of his past. Ed Harris is his longtime best friend and mob boss, Shawn Maguire. Both men have sons of similar age; one wants to be a ruthless crime boss like his dad, the other is a good and honest family man estranged from his own father. When life-threatening violence erupts between them, Conlon is forced to save his son's life by killing the son of his best friend. The gauntlet is thrown down, and Maguire vows revenge on Conlon and his entire family. With an army of professional killers on his trail, Conlon wages open war in the New York streets to protect a son who wants nothing to do with him. It's going to be a long night.

The HD picture sports a dark and deeply saturated color scheme, with solid blacks and golden pastel hues. Skintones are rich and consistent, with superb clarity and detail on the cracked and weathered faces of Neeson and Harris. The dirt, blood, and grime are palpable. The soundtrack is a rousing 7.1 DTS-HD Master Audio, and it will fill your speakers with gunshots, car crashes, explosions, and fistfights aplenty without overpowering the center-channel dialogue track. It's an even and impressive mix on all fronts.

Extras are minimal: two short featurettes and a collection of deleted scenes. DVD and Digital Copy are included.

Run All Night features a tired formula that's been done better in other films, but Neeson could sell ice to the Eskimos when it comes to kicking ass. And he does it so well that we never seem to tire of watching him do it. So move over, Chuck. Now there's something meatier.

● Corey Gunnestad



BLU-RAY
STUDIO: Warner Bros., 2015
ASPECT RATIO: 2.40:1
AUDIO FORMAT: DTS-HD Master
 Audio 7.1
LENGTH: 114 mins.
MPAA RATING: R
DIRECTOR: Jaume Collet-Serra
STARRING: Liam Neeson, Ed Harris,
 Vincent D'Onofrio

PICTURE
SOUND
EXTRAS

PICTURE
SOUND
EXTRAS



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X-MEN: DAYS OF FUTURE PAST— THE ROGUE CUT

BACK TO THE FUTURE... PAST

Fox

► Remember reading that Oscar winner and *True Blood* star Anna Paquin was going to reprise her role as the mutant Rogue in the most recent *X-Men* movie, *Days of Future Past*? And then the movie came out and she was in exactly two shots with nary a word of dialogue, and even that moment came a scant four-and-a-half minutes before the end? Well, there was in fact more planned for her, and the new “Rogue Cut” reinstates her scenes as part of a rethought, expanded version of the movie. To be frank, it’s largely the same story you’re probably used to. Rogue’s return has minimal impact on the plot, but there are lots of other little changes along the way too, successfully enhancing the overall drama.

In general, the 2.4:1 image here displays consistently high technical quality, with no jarring disparities even at the points of seamless branching to the theatrical cut, save for a few added shots that exhibit that mildly unpleasant, strobe-y digital video look. But I really appreciated the fine layers of the visual effects during this viewing, the faint puffs of smoke, minute water droplets hanging in the air, and so on. Text is featured prominently in many scenes, and it’s plainly legible.

New music was required to accompany the new scenes, and the recording and 7.1-channel mix are exemplary. The effects are pushed aggressively into the surrounds for an immersive experience from start to finish. This being an epic action adventure, there’s also heaps of bass, particularly for the big beats involving those oversized marauding Sentinels. A terrific soundtrack in any version.

The relative paucity of special features on the original *Days of Future Past* Blu-ray is absolved by this fresh two-disc set. Here finally are not one but two director commentaries: one unique to the new Rogue Cut in which helmer Bryan Singer is joined by composer/film editor John Ottman, the other with Singer and screenwriter Simon Kinberg, on the theatrical version. Over on Disc Two, the nine-part behind-the-scenes program is fine, I suppose, whereas the half-hour roundtable conversation with the cast wrangled by Singer and Kinberg is giddy, geeky fun. (James McAvoy’s T-shirt is priceless.) We’ll also find an extensive image gallery, and a Second Screen app plus a Digital Copy of The Rogue Cut rounds out this edition. The expanded movie is an entertaining curiosity, but the new extras make this one a complementary double-dipper. **● Chris Chiarella**



BLU-RAY

STUDIO: Fox, 2014
ASPECT RATIO: 2.40:1
AUDIO FORMAT: DTS-HD Master Audio 7.1
LENGTH: 149 mins./131 mins.
MPAA RATING: Unrated/PG-13
DIRECTOR: Bryan Singer
STARRING: Hugh Jackman, James McAvoy, Michael Fassbender

PICTURE	★★★★★
SOUND	★★★★★
EXTRAS	★★★★★



SPIDER BABY

FEAST OF THE EIGHT-LEGGED FREAKS

Arrow Video

► *Spider Baby* follows the story of the three inbred, adult Merrye siblings, the last of their line, living in a dilapidated mansion under the care of loyal family chauffeur Bruno (Lon Chaney, Jr.). Sisters Elizabeth and Virginia (Beverly Washburn, Jill Banner) and brother Ralph (Sid Haig) suffer from a mental illness that makes them revert to a childlike state, trying to eat people after trapping them in makeshift spider webs. Bruno has been covering up their actions, but it becomes impossible when distant relatives arrive to remove them from their home.

From the mind of Jack Hill, who would go on to write/direct the Blaxploitation classics *Foxy Brown* and *Coffy*, this is a madcap ’60s genre piece typical of Hill’s potboiler filmmaking. The movie blends the Gothic and the macabre with subversive comedic overtones and a sexual undercurrent.

Mike Hyatt and writer-producer Hill oversaw the high-def restoration of *Spider Baby*, which was taken from the original 35mm camera negative and a section of the director’s cut from a vaulted 35mm check print. The high-definition transfer was done on a Spirit Datacine; restoration work was completed on a DaVinci Revival. The result of the extensive restoration is a detailed and organic black and white transfer to Blu-ray in AVC 1080p. In a couple of places, age does show. Perhaps the source damage of the check print comes into play where tramlines, heightened grain, softness, and weaker contrast can be seen. Otherwise, this is a splendid and pleasant-looking disc.

The audio is offered in a basic LPCM 1.0 track. The sound has been restored as well as can be, but ultimately it’s constrained in dynamic range and frequency response. Still, it provides clear dialogue with little source noise.

For collectors in the know who don’t mind importing their wares, the Arrow label has already built a reputation in the U.K. releasing finely restored films stuffed with extras. *Spider Baby* continues the trend. They are too plentiful to be fully enumerated, but the stronger inclusions are Hill’s 1960 student film *The Host* (in HD)—a major influence on *Apocalypse Now*—an audio commentary with Hill and Haig, and a 2012 panel discussion at the Academy’s Film-to-Film Festival featuring Hill and stars Quinn Redeker and Beverly Washburn. We also get reversible sleeve art and a collector’s booklet with essay, stills and more. A DVD is also included.

● Brandon A. DuHamel



BLU-RAY

STUDIO: Arrow Video, 1967
ASPECT RATIO: 1.66:1
AUDIO FORMAT: LPCM 1.0
LENGTH: 84 mins.
MPAA RATING: Not Rated
DIRECTOR: Jack Hill
STARRING: Lon Chaney, Jr., Carol Ohmart, Quinn K. Redeker

PICTURE	★★★★★
SOUND	★★★★★
EXTRAS	★★★★★





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PRESENCE, IN THROUGH THE OUT DOOR & CODA—SUPER DELUXE BOX SETS LED ZEPPELIN

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And as we wind on down the road, we have now officially arrived at the home stretch of Led Zeppelin mastermind Jimmy Page's master plan of reissuing all nine of the mighty Zep's studio offerings in Super Deluxe Edition box set form. Not only has the studio wizard's magic remastering wand gifted us with a plethora of bonus tracks—mainly consisting of fascinating works-in-progress outtakes and alternate mixes, as opposed to troves of unreleased songs—but Page has been adamant about going the full-on 96-kHz/24-bit route in order to "future-proof" the catalog for whatever audiophile upgrades are yet to come. (Knowing how audio formats tend to go, however, that song may not remain the same as time marches onward.)

At any rate, the final Zep reissue slab consists of the oft-underrated troika of *Presence* (1976), *In Through the Out Door* (1979), and *Coda* (1982), and, like the previous six albums, you can select single CDs or single 180-gram LPs, or Deluxe Edition double CDs or 180g LPs (three discs and two 180g LPs, in the case of *Coda*) with the aforementioned "companion audio" bonus tracks. And I have to echo the sentiments in my September 2014 review of the first three Zep reissues: the absolute must-have versions are the three Super Deluxe box sets, each of which have all of the remastered and additional material on both CD and 180g LPs, plus a digital download card to get all the content in 96/24. Naturally, HDtracks.com has all three releases available for download at 96/24 if you can't get your hands on these Super Deluxe boxes (though you really, really, *really* should if possible).

Presence was born out of difficult personal circumstances, recorded after vocalist Robert Plant suffered a serious car accident in Greece in August 1975. The differences between the final mix of lead-off track "Achilles Last Stand" and the alternate "Two Ones Are Won (Achilles Last Stand Reference Mix)" are relatively subtle—hard to imagine I'd ever use the word "subtle" to describe *any* aspect of this absolute beast of a song—but they're quite telling: Page's intro riff and solo breaks aren't as sinewy or as upfront as they are in the final version, nor is his outro quite as hypnotic or dreamlike. Plant's vocal has less of an echo in the back half, but John Bonham's drumming is as muscular as ever—reinforcing why it's my third-favorite performance of his, right behind his devastatingly pocket-stellar work on *Led Zeppelin IV*'s "When the



"Levee Breaks"
and *Physical Graffiti's*
"Kashmir."

In Through the Out Door was the one Zep album driven the most by the songwriting and compositional proclivities of bassist/keyboardist/secret weapon John Paul Jones. My all-time zenith Zeppelein track, "Fool in the Rain," is one of the most unusual in the band's catalog—not only does it exhibit a 12/8 polyrhythmic groove, it features Bonham doing the patented Bernard Purdie shuffle. "Fool" also contains a 2-minute samba breakdown section and one of Page's most distinctive guitar solos, played via an MXR Blue Box effects pedal to get that gnarly,

fuzzed-out down-low octave sound. The bonus "Rough Mix" shows the amount of work still needed to bring this song off the wrong block and on to the top—Jones' six-beat bass line is too prominent during the verses, and Bonzo's drums and additional percussion are much too loud during the back end of the samba.

Coda was the original odds 'n' sods collection Page compiled following the death of drummer John Bonham in September 1980. Its contents spanned the band's own decade-long lifespan, and Page goes to town with a double-disc dip of outtakes. "Sugar Mama" is a lost bluesy gem from the 1968 sessions done for the first album at Olympic Studios, and it springs ahead like a crawling king snake uncoiled. The brawny instrumental "St. Tristan's Sword" was forged during the 1970 *Led Zeppelin III* sessions, a fine talisman that marks the magical charm of Page-Jones-Bonham's frenetic interplay. Two utterly mesmerizing readings Page and Plant performed with the Bombay Orchestra in India in 1972—*Zep IV*'s "Four Sticks" (ahh, that flute!) and *Zep III*'s "Friends" (ahh, those strings!)—simply beg for a full album's release of those sessions. They also share a throughline with the mystically imperial versions of these two songs cut with Egyptian and Moroccan musicians in Morocco for 1994's semi-reunion project, *No Quarter: Jimmy Page and Robert Plant Unledded*.

If this trio of super deluxe boxes is indeed Led Zeppelin's last aural stand, the producer/guitarist can rest easy: the 96/24 legacy of this band is quite secure. All of my audiophile love to you, dear Pagey.

● Mike Mettler



Myrtgem Ltd.

CD & LP

LABEL: Atlantic/Swan Song
AUDIO FORMATS: 44.1-kHz/16-bit
PCM Stereo (CD); 96-kHz/24-bit
(via download card)

NUMBER OF TRACKS: 12 on 2 CDs (*Presence*), 14 on 2 CDs (*In Through the Out Door*), 23 on 3 CDs (*Coda*)

LENGTH: 1:15:02 (*Presence*),
1:29:33 (*In Through the Out Door*), 1:33:22 (*Coda*)

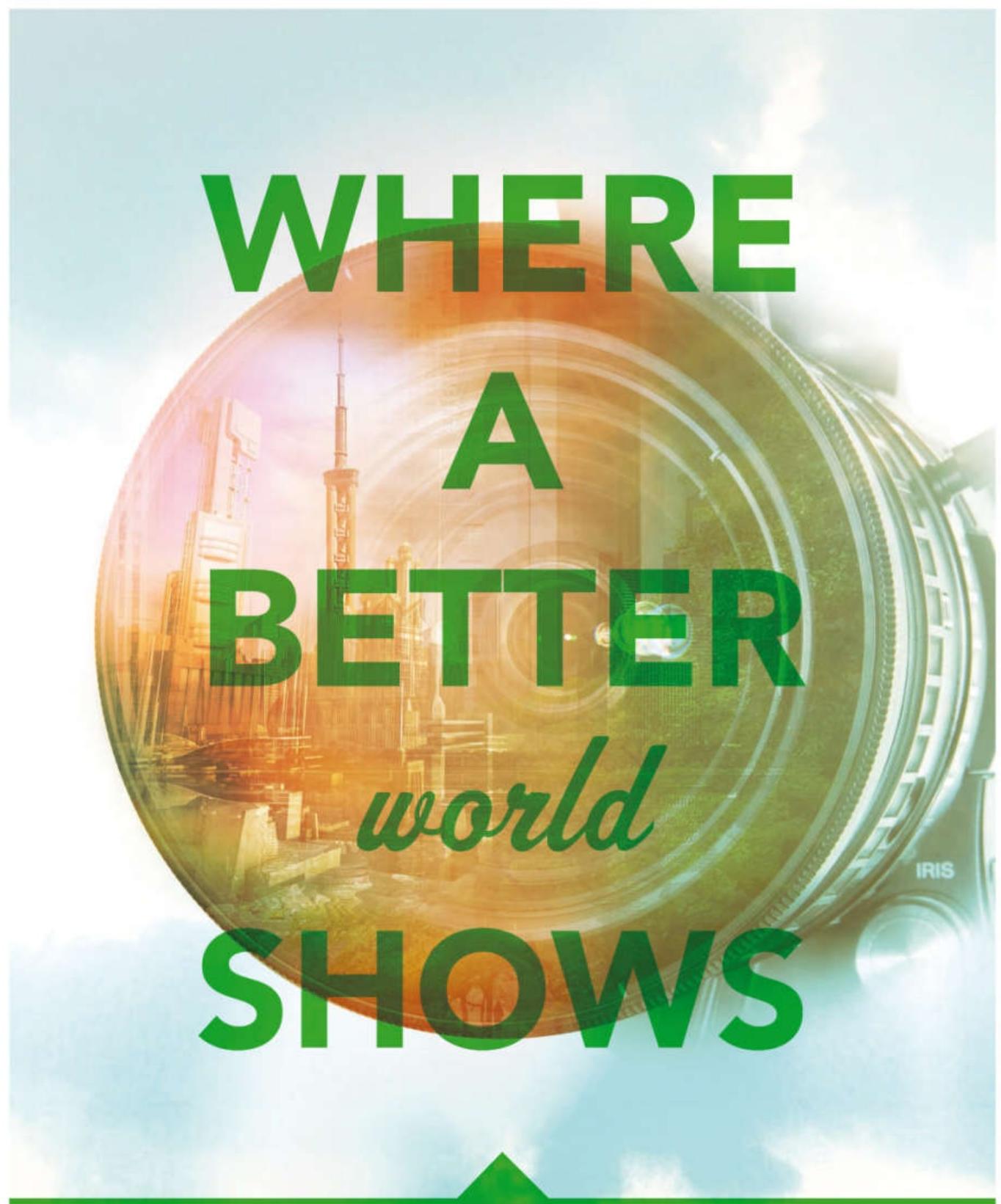
PRODUCER: Jimmy Page
ENGINEERS: Keith Harwood,
Jeremy Gee (*Presence*), Leif
Mases, Lennart Östlund (*In
Through the Out Door*), Andy
Johns, Eddie Kramer, six others
(*Coda*), Drew Griffiths (companion
audio on all three)

PERFORMANCE ★★★★★

SOUND ★★★★★



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Serene Audio Talisman Speaker

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It might take a minute to process what you're looking at. Those squiggly figures are not pieces from a life-size puzzle, and you won't find them in the gift shop at Muir Woods (or some other rustic destination). Nope. What you see is the brainchild of Sia Rezaei, who had been building speakers as a hobby until he took on the challenge of making "some awesome desktop speakers" back in 2010.

"I was basically looking for an audiophile-worthy setup for my desk, and all computer speakers fell short of my expectations," he explains. "The first couple speakers I built didn't meet all my expectations, so they ended up as gifts for less discerning listeners. But then I came across what is now the ancestor of the Talisman we sell today. I was so impressed with it, I decided to share it with the world, and that is how Serene Audio was born." The company launched its first products in January 2011.

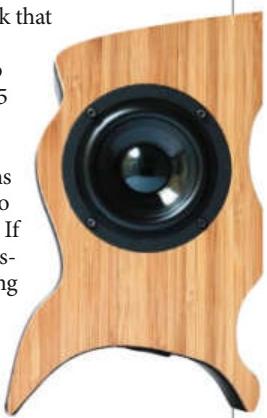
On the forums, Rezaei lists "making weird speakers" as one of his interests, but I like to think of the Talismans as exotic. "The design was mainly an aesthetic choice," he says. "I wanted something that would stand out but give you joy when you look at it." The speakers are hand-crafted in Serene's workshop in

Vancouver (British Columbia) using solid bamboo, leather, and brass "for a classy look that blends well in an office environment."

The Talisman is not very big at all. From top to bottom, it stands a mere 8 inches tall and is only 5 inches wide and 6 inches deep. It uses a single high-quality driver that sacrifices sensitivity for very low-level distortion, which as Rezaei explains is not an issue because the amplifier is designed to provide ample power "without breaking a sweat." If measurements are your thing, Serene provides distortion plots at sereneaudio.com/drivers, including one that compares its driver with the one B&W uses in its MM-1 speaker.

The amplifier is an in-house design that is directly coupled (as in no crossover) to the driver. At the core of the amp is a 24-bit DSP chip, the use of which Rezaei goes out of his way to explain in a Note to Audio Purists on the company Website: "We have carefully used DSP only to help the speakers stay true to the original mix, and not to try to 'improve' or 'enhance' it." Bass response at the -3-decibel point is rated as a very respectable 65 hertz thanks to the synergy between amp and driver. Want to go lower? No problem: An auto-detecting subwoofer output is provided."

So how much does this sonic gem cost? Would you believe \$395 a pair with free shipping and a 30-day return policy?—Bob Ankosko



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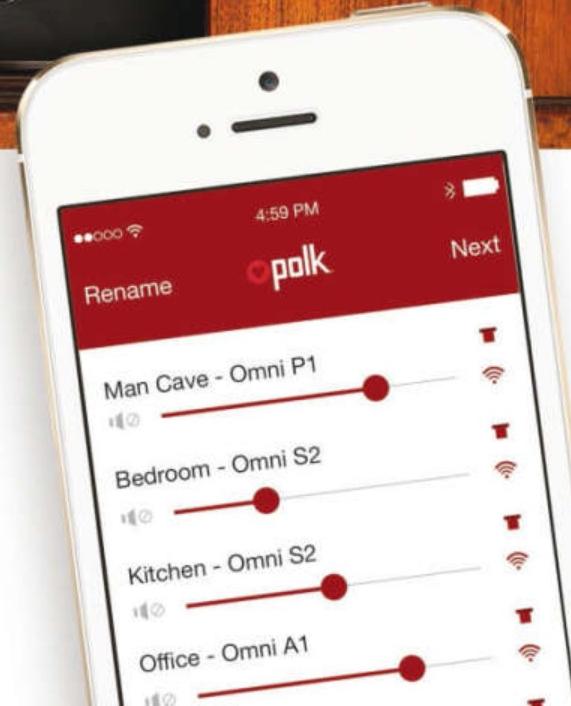
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